

# Digital Digest

Vol. 3 No. 4

Devoted entirely to Digital Amateur Radio Communications

July/August 1990

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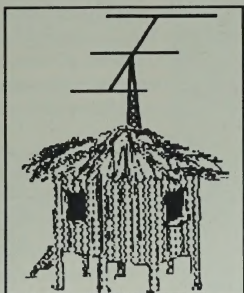
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## From The Publisher's Shack

Reading about all the discussion and controversy on what it is going to take to improve the ranks of amateur numbers has caused me to do a bit of reminiscing of my own early introduction to electronics and the world of amateur radio.

My start came when somehow our household received an Allied Radio/Knight Kit catalog in the mail. Though I, at the tender age of nine had no knowledge of electronics or any predisposition towards the hobby, there was something about that catalog that sparked my interest in this electronics

stuff. I do remember that some of the artwork showed radios with matching copy that read something to the effect... "Travel the world from your armchair... with the new Ocean Hopper Regenerative Receiver." Well, the Ocean Hopper was a little out of the question for the moment but there was an interesting one-transistor AM radio kit that looked like something I might be able to tackle. Since my tenth birthday was around the corner (this was 1956), I approached my parents to see if I could have the radio. My parents agreed to think about it. Surprise! On my birthday, yep, I got the radio.

Now came the real challenge... putting the kit together. How difficult could a one-transistor radio kit, containing all of a half dozen parts be? Well, hours later and with globs of solder everywhere, even where solder shouldn't be... the kit was done. The longer than anticipated glorious moment of truth was finally at hand! I nervously attached the 1.5v battery, plugged in the earphone and turned on the switch. What happened? You guessed it... nothing! Well, have no fear, the weekend is at hand and Dad will be home. Dad will get it working just as he has always fixed the plumbing and most generally everything else that has ever needed fixing.

I recall with fond memories that weekend my dear father spent with me trying to get that radio to work. By Sunday afternoon my Dad said, "Lets take it to Grandpa, afterall, he's a retired electrical engineer, he should be able to figure it out." Well, that's what we did, and five minutes later, after clearing a few solder bridges and cold solder joints, the radio did come to life!

(cont'd on page 3)

## Digital Digest

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4063 N. Goldenrod Road • Winter Park, FL 32792

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# AEA's NEW PK-232MBX<sup>TM</sup> With PakMail<sup>TM</sup>



Now AEA's popular PK-232 multi-mode data controller has new features you've been asking for...PakMail<sup>TM</sup> Mailbox with selectable third-party traffic, seven-character AMTOR (CCIR R.625) call identity, TDM (Time Division Multiplex) receiving for SWL's, and Prioritized Acknowledgement (ACK) protocol for improved packet performance. Compatible with almost every computer or asynchronous data terminal, you can enjoy the full spectrum of amateur digital communications with AEA's new PK-232MBX.

**All Operating Modes.** The PK-232MBX includes all authorized amateur digital modes available today...Morse, Baudot, ASCII, AMTOR/SITOR 476 and 625, Packet, WEFAX receive and transmit, as well as commercial standard NAVTEX automated marine information services.

**Superior Modem.** An eight-pole Chebyshev bandpass filter limiter-discriminator modem improves the signal-to-noise ratio at the detector and virtually eliminates interference from adjacent signals. System performance has been proven superior to that of PLL modems designed for telephone line services.

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**WEFAX Transmission and Reception.** AEA brought you the first multi-mode controller to send and receive WEFAX (weather facsimile) charts. The PK-232MBX directly supports the widest range of printers on the market using the optional RS-232/printer cable.

**Host Mode.** Only AEA provides the type of full-featured Host Mode preferred by many professional programmers for efficient control of the PK-232MBX. AEA's Host Mode programs include PC-Pakratt with FAX for the IBM PC's and compatible MS-DOS computers, COM-Pakratt with FAX for the Commodore C-64 and C-128, and now MacRATT with FAX for the Apple Mac-Intosh.

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**You Deserve The Original.** AEA produced the first multi-mode data controller. The PK-232 continues to be the standard against which all other multi-mode controllers are judged; the choice of critical amateurs, commercial services and government agencies. Don't settle for less than the best.

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```

CONVERSE    CONNECTED TO N7HJD
5531 B 4287 ALL 0400 N7HJD 24-Jan pk-fax...meat
5458 B 2956 ALL 0400 N7HJD 28-Jan Hans & Loukasia
5457 B 4637 ALL 0400 N7HJD 28-Jan KB7IH

```

Enter connect path, hit CR to terminate:

N7HJD

```

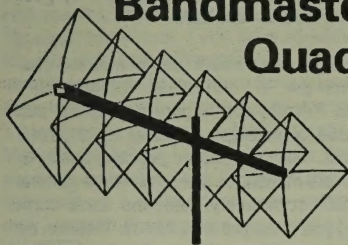
5112 B 1612 ALL 0400 VE7DPH 04-Jan Packet in South Africa.
5111 B 1370 TCP/IP 0400 VE7DPH 04-Jan International TCP/IP news.
5866 B 439 ALL 0400 VE7DQC 03-Jan TANDON DRIVE PARTS
2849 B 537 ALL 0400 WATNIF 12-Sep PK232 Settings For KISS Mode
KE7OH Hb<

```

Signal here is good, I am using an ICOM 280, PK-232, IBM Turbo XT Clone, all going into an Isopole, 50 feet up...



## Bandmaster Quads®



### ALABAMA AMATEUR ELECTRONICS...

has launched a complete new line of Amateur Service, light weight, all-fiberglass quad antennas for the amateur bands 10 meters through 70cm. Utilizing advanced construction techniques and tool-free assemblies, AAE's Bandmaster Quads are available in an assortment of two to six element versions. Boom sizes range from 24 inches, for 440 MHz, to 15 feet for the 4 element 10 meter system, weighing 18 ounces to 39 pounds, respectively.

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Bandmaster Quads are not kits, reports AAE. They come fully assembled or ready to snap together, require no balun or matching network, and are maintenance free. Complete assembly and installation instructions show vertical and horizontal polarization. AAE offers a full replacement guarantee for one year on all lines.

Alabama Amateur Electronics, founded in 1989 by Bill Levey, WA4FAT and Jay Ross, AB4MX, first introduced 3, 4, and 6-element 2 meter quads for FM, packet radio and direction finding (fox hunting). "Growing demand for our Bandmaster Quads led to new models," said Ross. "I fully expect that the quality of our construction, the ingenuity of our design, their exceptional light weight and unequalled performance, will make all Bandmaster Quads outstanding contributions to the Amateur Service for many years to come."

For more information and pricing, contact: Alabama Amateur Electronics, 3164 Cahaba Heights Road, Birmingham, AL 35243 Tel: (205) 967-6122

#### Continued from front page

Something else came to life that weekend. A destination and a goal... not only to be a ham radio operator... but also the interest to forge a career in the field of communications which to this day has given me years of continued challenge and rewards.

The point to relating my own early experience is that I was, indeed fortunate to have been exposed to the hobby at an early age and also to have had parents, and even grandparents who were supportive of my early interest in electronics. Once the "bug" had bitten, nothing was going to stop me from getting a ham license. Code or no-Code was not an issue, I just wanted to be a "Ham" and was willing to do whatever it took.

Once today's "code/no-code" issue is resolved, the question is, "Will it really make a difference in our attracting new blood to the hobby?" After all, it seems that a vast majority of the awareness on this issue comes from the amateur ranks. The controversy basically becomes a non-issue to the multitudes of youngsters and parents who are not even aware that the amateur radio hobby exists.

The issue needs to be resolved, and we need to be realistic in what the motives are for maintaining the CW proficiency requirement in today's communications environment. Most importantly, I believe we need to be more zealous in our approach to promoting the fun, excitement, and the fulfillment in life-long careers in which a ham radio license can be the catalyst. We, as amateurs, need to help lead communications technology, not follow it, if we are to maintain our precious spectrum and not forfeit it to commercial interests. We need to put the spark of enthusiasm in today's youngsters to want to be hams... and in their parents to encourage them.

I'm not offering any solutions here, just perhaps, some additional food for thought, and to say, "Thanks Dad"... for that long weekend, and the love, support and encouragement that came with that radio kit so many years ago...

Til next issue, 73... Tom / WA8DXD

### MFJ ENTERPRISES...

has released its new model MFJ-1278T Turbo Multi-Mode Controller with built-in 2400 baud modem. The 2400 baud rate gives the user the ability to communicate faster while reducing chances of errors (and collisions) during transmission. The 1278T is fully compatible with current 1200/300 baud communications and older TNCs. Other features include a built-in dedicated printer port, MFJ's trademarked Easy Mail mailbox system, a 20 LED precision tuning indicator, multi-gray level FAX/SSTV modem, AC power supply and much, much more. Priced at \$359.95, the MFJ-1278T is the first of a new breed of higher speed data controllers for amateur digital communications.

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MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762. Telephone (orders only): (800) 647-1800; fax: (601) 323-6551

### KENWOOD USA...

has installed a new toll-free service for amateurs requesting parts. The new number is exclusively for Kenwood amateur radio parts and is designed to make their purchase as easy as possible. The number is (800) 637-0388 and operates 9 a.m. to 6:30 p.m. EST Monday - Friday with payment options that include Visa, MasterCard, cash, check or certified funds.

### RF CONCEPTS AND KANTRONICS, INC...

have announced a new dual-band amplifier, the RFC 2-70, which provides 30 watts of output on 2 meters and 25 watts on 440 MHz with only 5 watts of drive. Designed for use with radios such as dual-band talkies, the unit features automatic band-switching and dual GaAsFET preamps. From RF Concepts/Kantronics at your local factory authorized dealer. For more information write or call RF Concepts/Kantronics, Inc. 1202 E. 23 Street, Lawrence, KS 66045; Tel: (913) 842-7745.

### AEA HAS ANNOUNCED...

the availability of a new 2400 baud option for the PK-232 and PK-232MBX multi-mode data controllers. The 2400 baud option is based on an XR2123A PSK Modulator/Demodulator chip utilizing CCITT standard V.26(b). The remaining circuitry on the modem board supports the XR2123A, including a front-end filter. The 2400 baud option and

(cont'd on page 11)



## Packet & Bulletin Boards

I know I'm different than many packet users: talk to most packet ops and they'll tell you that packet isn't a ragchew mode, while most of my operation is keyboard to keyboard. I also know that I'm the same in one area: I use the Bulletin Boards, but I haven't devoted a whole lot of time to the latest capabilities in the newest software. So, what's out there?

There are four major bulletin board programs in use around here: W0RLI, WA7MBL, BB (AA4RE) and MSYS (WA8BXN). For this discussion, I'll be talking about the capabilities of the AA4RE software simply because the closest bulletin board runs that program. If your local system runs different software, check the help command, and if I haven't listed your favourite program, my apologies: the above software represents the "most popular" in this area, not the best. I should also note that, for the user, these packages are pretty much the same, but for the system operator (SYSOP) they do differ significantly. Most have some way of supporting more than one user at a time, either by multi-tasking, or by running more than one copy under some kind of multi-tasking shell.

### The basics:

The first step to using a bulletin board is finding one: this is usually pretty easy since most packet channels have at least one bulletin board, and most bulletin boards send a beacon (usually addressed to BBS or MAIL) telling who has messages on that system. Of course, if you don't see one on your channel, just ask someone. Once you've found the bulletin board, just connect to it. You will receive whatever "news" the SYSOP has placed on the system, plus some information for the new user. You'll also be asked to register. Registration on some systems is optional, and on others, it's mandatory.

When you register, answer each question as accurately as possible, your answers will probably be automatically placed in a national database and used for routing your packet mail worldwide. When you're through, either use the "B" (bye) command, or just disconnect. Once you get connected (and registered), you'll get a command prompt that looks something like this:

Command (L,R,S,K,W,D,U,J,B,I,T,X,H)>

If you forget everything else, remember that H is HELP (most systems also use ?, so either will work). Most commands are just one letter, so some commands are a little strange (it's obvious that the "heard" command, "J" came after the help command).

### Messaging:

Probably the single largest use of bulletin boards is sending messages. Each message carries a header telling who it's from, who it's for, what bulletin board (or group of bulletin boards), when it was sent and what it's about. The header also contains the message number, which is simply the serial number of that message on that particular system.

The three most often used commands are L (list), R (read) and S (send): The simplest form of list is simply "L" -- list all new messages.

When you first log on to a bulletin board, all messages are new, so it's not a good idea to use this command the first time you get on. "LN" (List New) is the same as L on most systems. "LM" will list all messages addressed to you (List Mine). "LL #" will list the last # messages, i.e. LL 25 will list the last 25 messages.

The "L>" and "L<" can potentially be the most creative: L> is list messages addressed to, and L< is list messages from. Since many messages are broadcast messages, the "to" address can provide a shorthand for various interest groups: "SALE" for items for sale, "AMSAT" for satellite info, "SPACE" for general info about the space program, etc.

Once you've found a message of interest you need to be able to read it which brings us to the "R" (read) command. "R #" reads the message stored under that number on this system. Note that there may be gaps in the message numbers, caused either by messages that are deleted, or that are personal and not addressed to you. ("Personal" messages are those which are not of general interest, no message carried via amateur radio is truly personal, keep that in mind!) "RM" is used to read messages addressed to you -- "Read Mine." "R>" and "R<" read messages to or from a specific station. Again,

private messages may be omitted by your Bulletin Boards' software.

Messages can be sent (sometimes too easily) with the "S" command. "S" and "SP" (Send Private) are usually equivalent and intended for messages which are not of general interest. "SB" is used for sending bulletins, which are messages of interest to the general amateur community. After the send command you must put an address. This can be as simple as the callsign of a local station who checks into the bulletin board you are using, or as complex as a message to WT7P @ W7XI. OR. USA. NA. The second example is what is commonly called a "hierarchical address," in this example, to WT7P on bulletin board W7XI, in Oregon, in the United States, in North America.

My address is  
WB6UUT @ WK6K.#SOCAL.CA.USA.NA.

#SOCAL is a somewhat local addition meaning Southern California to get messages "started" at the right end of the state. Bulletins are commonly sent to "ALL @ ALLUS" -- others in common use around here are ALLCA (all California), ALLCAS (all California-south), ALLSWD (All ARRL Southwestern Division), and occasionally, USA instead of ALLUS. Something which is beginning to develop here is the use more descriptive addresses than "ALL" -- whenever possible try to use these more descriptive addresses and encourage others to do so.

Following the send command, you are prompted for a subject, and then the text of your actual message. The subject should be fairly short, and in a bulletin, as descriptive as possible (most stations have quit reading messages to ALL with the subject "For Sale" because most of the time the sender is selling something they don't want, put the item in the subject!). Your message text is limited, but is large enough for everything but the longest "magnum opus" -- it is unfortunately common to see messages with the same subject plus "part 17 of 24" but some folks are just long-winded. End your message with either a Control-Z, "/EX" or whatever is in local use.

### Some addressing dos and donts:

It should be obvious already that messages addressed to "ALL @ GALAXY" are to be discouraged, especially if the subject is "For Sale" and it's advertising something like memory boards for some obsolete com-



puter. Try to be descriptive with your "To:" address in bulletins, and try to address it to the appropriate area. If you have something for sale, address the message to the local area, then expand if the offers don't come in. Also, when you sell something, do you need a message to "ALL @ ALLUS" to tell us? Many current bulletin boards will accept almost anything in the To: field. I'd like to see this tightened up a bit to accept only callsigns and "standard" identifiers like AMSAT or WANTED.

Finally, make sure you know what bulletin board someone checks into when you send mail: something addressed to WA4EGT @ WD4HIM will forward all the way across the U.S., but will never be delivered -- WD4HIM is in Florida, and WA4EGT is in California. Most bulletin boards will include instructions on accessing the "White Pages" (commonly referred to as WP), which is the national directory I mentioned at the start of this article. This system was originally implemented by WD6CMU. Any station at any Bulletin Board can access the White Pages and find the home bulletin board of any registered amateur.

To find WA7HRA, send a message to: WP @ WD6CMU.#NOCAL.CA.USA.NA, with the subject QUERY and WA7HRA QTH? as the single line of text in the message. Note that many systems only forward mail at night, so your message may take awhile getting to its destination. Also, if you have ever wondered about those bulletin boards who won't accept users, most notably on 20 meters, but also on some VHF channels, these systems are only available for forwarding on these frequencies. Particularly on 20 meters where throughput is slow, limiting the number of stations greatly speeds up forwarding, and the "hop" on HF allows mail to travel long distances quickly. Other commands: One handy command is the J(who) command which lists who the bulletin board has heard lately.

Some systems support an "X" command allowing you to gateway between ports on the system (and usually between bands). The "W" command usually tells you what files (or what file categories) are on a given system, while the "D" command lets you download these files. Binary (program) files usually need compatible terminal programs, and no true binary file transfer standard currently exists -- consult your local SYSOP for his favorites.

I have of course left out the majority of commands: there is usually a fairly long file which may be downloaded which covers all of the commands on your local system, and it's good to print this file so you can study and refer to it. You could also print some extras and save network time by giving printed copies to your friends.

In closing, let me also offer my thanks to those who write Bulletin Board software for amateur use. Most of these folks are doing this for the "kick" of writing software and for the pleasure of seeing their work benefitting Amateur Radio. Also, your local SYSOP who is usually devoting several thousand dollars worth of equipment (not to mention his electric bill) to the "cause." Most SYSOPs would no doubt appreciate the occasional "attaboy" and offer of assistance.

#### Soapbox:

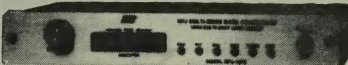
For a number of years I've seen brand new amateurs come charging into the ranks, rush out and buy a TNC, make their first contact and what do they talk about? PUTTING UP A BULLETIN BOARD! As the preceding article suggests, a bulletin board is a very handy thing to have around, and a good bulletin board serves an area very nicely. If the bulletin board is heavily used, it is also the main source of traffic on a given channel. Put two bulletin boards on the same channel, with similar (and heaven forbid, wide) coverage and the channel can grind to a halt. Before you put up a bulletin board, get on, talk to people, find out what is out there and if there is a need. Then establish a bulletin board. In some areas, bulletin boards are informally (or even formally) coordinated to help ease the channel loading problem.

While I'm on my soapbox, I'd like to throw my comments into the ring about host mode:

In the deep, dark past (about 1982), I wrote a bulletin board for the Apple II family and the original TAPR Beta TNC. It wasn't easy since I couldn't ever be sure which mode the TNC was in, or where text came from, the TNC or the user. A good host mode tags everything coming from the TNC with its source (including the channel number, essential when more than one channel is active) and everything going to the TNC is clearly labelled as to its destination (to the TNC, or to which user). Host mode may seem like extra work when you are designing software, but it makes the

(cont'd on page 13)

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MFJ-1270B

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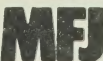
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## Some Thoughts On Operating Practices

While recovering from a bit of open heart surgery, I've been spending some of my time reading the messages and bulletin traffic that passes through my six-port packet switch! I gotta tell ya - some of the stuff in there absolutely makes me wanna puke!

I'm not referring to WHAT people say - I have no bones to pick with opinions when they're honestly expressed - even when I disagree with them and their opinions. My hangup is with the WAY in which people express themselves on packet radio!

In all my 25+ years of fiddling with this stuff called "data", I've never before seen such a collection of garbage formats! You'd surely believe that some of these people just can't read or write their native tongue, don't know or understand ANYTHING about how to type a message, or else they simply can't find their way around their TNC's user's manual! It's just incredible! What AM I talking about? Where shall I begin? How about CASE?

I'm stupefied by the number of folks in packet radio who insist on typing EVERYTHING in UPPER CASE all the time. Save for a few individuals afflicted with vision problems, there's NO EXCUSE for UPPER CASE ALL THE TIME!

In our present modem and telecommunications community, UPPER CASE is commonly seen as "SHOUTING"! So why are these people SHOUTING at us all the time on packet radio? Are they actually typing to their TNCs with a Teletype (tm) machine that allows them no choice? Are their CAPS LOCK keys broken in the ON position?

Let me say that I do understand how UPPER CASE can serve to emphasize the point that the writer is making. But how much do these dudes want to emphasize? Frankly, given that I'm neither a UNIX person or a C language freak, I'd much rather see everything typed in lower case instead of UPPER CASE! Lower case is really much easier to read, much more pleasant to watch as it scrolls across my screens. Besides, UPPER CASE always makes me think of BASIC!!

Get with the program, folks....type your messages and bulletins using BOTH lower case and UPPER CASE!

Let's turn to another bruise on my digital brain. Who on earth says that Morse Code abbreviations belong on the digital modes? Where is it written that we need to struggle, not only with UPPER CASE, but also with lots of arcane and obsolete symbols and short-cuts that made lots of sense in Morse days?

I'm absolutely and categorically opposed to the dude that insists on writing, "FB ES PSE REMEMBR TT ILL B SHURE TO SEND U THE SAME" etc., etc. This type of pseudo-illiterate shorthand might have functioned on Morse, but in today's keyboard-driven operations, it has no place at all.

Now, please don't give me any of that horsefrocky about "I don't know how to type", or "I can't type more than 20 words per minute". These statements are just lame-brained, dumb, ineffectual excuses that prove nothing and only irritate me more.

In these days of buffered terminals and computers running smart communications programs, there's simply no excuse for typing in this ancient, brain-damaged pseudo-shorthand. It makes no sense and serves no genuine purpose - other than to give your partner the distinct feeling that he's not using the mode he thinks he was! DON'T USE MORSE ABBREVIATIONS! Type your message or bulletin text "normally", just as though it were going to be read by a "non-ham". Try writing in English (or whatever your native tongue may be!). You might even get used to the idea!

Now let's talk about line formats. What's a "line format"? This refers to the number of characters typed on each line. In the most irritating cases, the packet user is in the default CONVERS mode and NEVER types a CARRIAGE RETURN (on many computers this is the <ENTER> key. The result in general is a line of typing that "runs on forever!" Well, if not "forever", then at least the line runs off my packet screen with some of my terminal programs.

Assuming that the user's TNC is set to the factory default values, the typed data are "packetized" and transmitted by the first CARRIAGE RETURN (which in the most obnoxious cases NEVER comes out of the computer's ASCII port!), or by the character

immediately following the value of PACLEN.

In the case of the factory-defaulted TNC, this means that the packet is actually sent by the 129th character typed by the user. But what if the user has set up his PACLEN to "0" or "255" (as so many of them appear to have done)? Then the line is actually transmitted by the user's TNC -- exactly that - 255 or 256 characters BETWEEN EACH CARRIAGE RETURN! So we get one of those long lines that, depending upon your terminal program, may or may NOT be readable!

Get with the program, folks...type your messages and bulletins using your <ENTER> key to install CARRIAGE RETURNS at a position someplace between the 70th and the 80th character on your screen (assuming that you DO have an 80-character display).

If you're confused by the variety of things you can do with your TNCs in this regard, let's take a look at some of the basics of your TNC's "formatting" codes.

For the purpose of argument, these initial instructions refer to AEA's popular PK-232/PK-87/PK-88 series of TNCs. For TNC-2 clones and other types of TNCs, please see the Table of Equivalencies at the end of this article.

### AUTOMATIC CARRIAGE RETURNS

**ACRDISP** - The ACRDISP command operates on data flowing from the radio or the TNC to the user's terminal.

ACRDISP is always followed by a numeric value known as the "argument". The argument is a number between 0 and 255, signifying the screen width of YOUR terminal.

The factory default value of "80" means that an automatic CARRIAGE RETURN (CR) is inserted after the 80th consecutive non-CR character. An argument of 0 means that this feature is disabled. Text is presented to your terminal's screen exactly as it is received from the sending station - good or bad.

**ACRRTTY** - The ACRRTTY command operates on the data flowing from the terminal to the radio in Baudot, ASCII and AMTOR modes.



ACRRTTY is also followed by a numeric value or "argument". The argument is a number between 0 and 255, signifying the assumed screen width of the distant station.

The factory default value of "71" means that a CARRIAGE RETURN is substituted for the first space after 66 consecutive non-CR characters, or is inserted after the 71st consecutive non-CR character, whichever comes first. An argument of 0 means the feature is disabled. Text is presented to your terminal's screen exactly as it is received from the sending station - good or bad.

**ACRPACK** - The ACRPACK command operates on the data flowing from the terminal to the radio in PACKET mode.

ACRPACK OFF means that the SENDPAC character is not added to outgoing packets.

ACRPACK ON (the factory default) means that at the point where the SENDPAC character causes a packet to be sent, the character itself is added to the end of the packet.

**CRADD** - The CRADD command operates on the data flowing from the terminal to the radio in Baudot.

CRADD OFF (the factory default) means this command does not modify the data.

CRADD ON means that each CR from the terminal is transmitted followed by a second inserted CR.

With CRADD ON and ALFRTTY ON, a CR typed at the terminal yields the CR-CR-LF sequence required by MARS operators.

## AUTOMATIC LINE FEEDS

**ALFDISP** - The ALFDISP command operates on the data flowing from the radio or the TNC to the user's terminal.

ALFDISP OFF means that this command does not modify the data.

ALFDISP ON (the factory default) in PACKET mode means that all received LINE FEEDS (LF) are ignored, and also that every received CARRIAGE RETURN (CR) is passed to the terminal followed by an inserted LF.

ALFDISP ON in Baudot, ASCII and AMTOR means that all received CRs are ignored, and every received LF is passed to the terminal

preceded by an inserted CR. In addition, ALFDISP ON inserts LF after every automatic CR caused by ACRDISP.

**ALFPACK** - The ALFPACK command operates on the data flowing from the terminal to the radio in packet mode.

ALFPACK OFF (the factory default) means that this command does not modify the data.

ALFPACK ON means that LFs from the terminal are ignored, and each CR from the terminal is transmitted followed by an inserted LF.

**ILFPACK** - The ILFPACK command operates on the data flowing from the terminal to the radio in packet mode.

ILFPACK OFF (the factory default) means that all LFs are passed without modification.

ILFPACK ON means that all LFs from the terminal are ignored. This would be useful for sending computer files that contain LFs.

ALFPACK ON overrides ILFPACK, as shown here:

ALFPACK	ILFPACK	Action:	CR	LF
OFF	OFF	CR	LF	
OFF	ON	CR	-	
ON	OFF	CRLF	-	
ON	ON	CRLF	-	

**ALFRTTY** - The ALFRTTY command operates on the data flowing from the terminal to the radio in Baudot, ASCII and AMTOR.

ALFRTTY OFF means that this command does not modify the data.

ALFRTTY ON (the factory default) means that all LFs from the terminal are ignored and also that each CR from the terminal is transmitted followed by an inserted LF.

In addition, ALFRTTY ON inserts LF after every automatic CR caused by ACRRTTY.

Here's a summary in tabular form of what you should expect from your TNC's formatting commands, and an idea as to how to use them to their best advantage.

Command	Direction	Action:	CR	LF
ALFDISP	ON (packet)	Terminal <- Radio	CRLF	-
ALFDISP	ON (RTTY)	Terminal <- Radio	-	CRLF
ALFPACK	ON	Terminal -> Radio	CRLF	-
ILFPACK	ON	Terminal -> Radio	CR	-
ALFRTTY	ON	Terminal -> Radio	CRLF	-

Because of the differences between the older TNC-1/TNC-2 kits and their commercial clones, and the AEA PK-232/PK-87/PK-88 family of TNCs, here's a Table of Equivalencies of these commands.

## PK-232/TNC-2 Command Cross-Reference:

PK-232	TNC-2
ACRDISP	SCREENLN
ACRPACK	CR
ACRRTTY	-
CRADD	-
ALFDISP	AUTOLF
ALFPACK	LFADD
ALFRTTY	-
ILFPACK	LFIGNORE?

*If you have any news or information of interest to the digital amateur radio community, please let us know!*

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## ESKAY PACKET:

### The Terminal Program You've Been Waiting For!

by Craig Rader, N4PLK

One of the most useful and powerful programs packet terminal programs to come along in a while is ESKay Packet, commonly referred to as "SP", written by Sigi Kluger, DL1MEN. It provides IBM-compatible users with many communications tools previously unavailable in any package and is being spread around the U.S. ham community as "shareware". With many, many SP- users in Europe and the number in this country growing by leaps and bounds, it is obvious that SP will be one of the most popular packet programs ever written.

There are many amateurs that recently upgraded to an IBM-compatible computer after deciding the Commodore 64 will not meet their need for more memory and speed. Users of the C64 packet program Digicom>64 will find similarities in the way SP feels. Having been a devoted Digicom fan for over four years, I was pleased with the similar features and also surprised with the extra capability that SP gave me on my AT-clone. For those of you not yet acquainted with SP, here is a taste of what this excellent code can do.

#### OPERATING SCREENS

To me the most important aspect of a packet program, or any terminal program, is the screen presentation and the amount of information I can get from it at a quick glance. In this area, ESKay Packet outdoes all others. SP presents a separate screen for each multi-connect session, (up to 8 sessions per TNC2 clone, 4 for both TNC220 and DRSI card), and a separate UNPROTO screen. Far exceeding the traditional "split-screen" found on most terminal emulations, SP's screen is divided into FIVE areas, (described from top to bottom):

- A transmit section into which you type either commands or outgoing text. This area has a full editor that enables you to re-send data, transfer data to another session, import or export files to/from disc files and scroll back to see earlier data you typed in.
- A status line which gives you a complete rundown on the session you are in, includ-

ing the frequency you are on, the type of packet frames that are sent to you, amount of retries, etc.

- A receive section that receives only connect status data and text from connected stations. The user can scroll back this portion of the screen a maximum of 409 lines depending on how much memory he wants to occupy.
- A session status line that gives the call signs of the stations connected to all the sessions. When data appears on an un-

monitored session, the callsign indication for that session becomes highlighted or can blink optionally.

- A monitor section that shows the activity of yours and other stations on the frequency. This size of this area is keyboard adjustable. If you wish, it can be eliminated, but the ability to monitor while connected, (without even changing screens), and still keep the incoming data from connected stations "clean", is a truly remarkable advantage.

Consequently, SP gives the "big picture" of the local network while letting you control many distinct QSO's intelligently. It also helps the user by allowing the color-coding of text. For example, I have Net/Rom headers, Info Frames and Control Frames all colored differently. This makes it easier to pick out the important stuff.

#### REMOTE DISC ACCESS

SP offers selective disc drive access to connected stations in the same way as Digicom. Given appropriate access by you in the program files, someone could connect and read or write text and program files to/from your hard drive. The following remote user help file, accessed by the remote command //H, is an indication of the commands available to connected stations:

HELP:

SP v4.00.14 (Apr 30 1990 - 1 TNC) IBM Hostmode Software

Info files displayed with //CAT can be read with '//R name'

//Catalog	= Show list of Files
//DIR	= Same as //CAT
//Kill FName	= Kill your message (Callsign.???)
//Read FName	= read text or message file
//RPrg FName	= Read a binary file
//Users	= List last 10-15 callers
//Write Call	= Write message to Call
//Write FName	= Write info
//WPrg FName	= Write a binary file
//n text	= Send 'text' to channel 'n'
//All text	= Send 'text' to all channels
//Connect Call TNC	= Connect with Call (possibly using TNC-number)
//CONVers	= Converse mode
//CStatus	= Connect status
//Disc	= quick disconnect
//Echo text	= Send 'text' back
//Help	= Help
//Info	= Display system info
//Lans	= display LANs
//Mheard (L or T)	= Heard list (L=long or T=last 7 stations)
//Nodes	= display TheNet / NET/ROM nodes
//News	= news from the operator
//Path (L)	= Show terminals (L=with path)
//Path Call	= Show path to 'Call'
//PFinder	= Show pathfinder paths
//Quit	= Disconnect
//Ring	= call SYSOP
//Terms	= Show terminals
//Time	= Give login time, current time, char count

(cont'd on next page)



Each channel in the SP program can be set up individually as a TheNet look-alike network node. When doing so, most of the above commands are accessible to connected stations without the "/" syntax. The help file shown above can be edited with a text editor, so you can delete any commands you would rather not publicize. But each command also has an internal "security" level attached to it so that the user can regulate who has access to what. If you prefer, you can turn the remote feature completely off.

## NETWORK PATHS

Ever get tired of typing in the same long paths to distant stations over and over again? Eskay Packet lets you pre-program connect paths which can be brought up and executed at will. Just type in the path in the following format:

CALLSIGN N>NODECALL D>DIGICALL N>NODECALL N>NODECALL ...

The next time you want to connect, simply give SP the command:

<ALT> C CALLSIGN

Then sit back and watch as SP connects to all the nodes and digis in your specified path. When it connects to the final callsign, it will send an audible and visual alarm so you can start typing text.

SP's Path Learning feature allows you to type in a new path as you are connecting manually. At the successful completion of the path, it will query you as to whether you want it permanently saved for future use. There is also an "auto-connect" feature that will execute pre-programmed paths, and even file transfers, at specified times in the absence of the user. Finally, SP's Pathfinding feature listens to the node broadcasts of local NetRom/TheNet nodes and selectively adds these paths to its path list. Should you desire to use them, these paths can be brought up in a menu. Just cursor down to the one you want, hit return and SP executes a connect to the distant node.

## FANCY TRICKS

A built-in converse node is nothing new to Digicom users. They have had the pleasure of packet roundtables since the advent of Digicom V2.03. SP does the converse routine with some enhancements though. It allows you, as SYSOP, to select which of the connected parties you want in a converse session and it will allow you to join and "un-join" them from the session at will. It will also allow you take any two of the stations connected to you and connect them in a conventional session to each other.

If that isn't enough, SP lets you edit the receive text from one session and send a particular sentence, paragraph or word to another session. How is this useful? Well, imagine connecting to a BBS on one session and your best ham buddy on another. You could share the latest "juicy tidbit" from the BBS with him real time.

Did I mention binary file transfers? Eskay Packet does this with its own transfer protocol, not YAPP or XMODEM. This will limit binary file transfer, as far as I can tell, to other SP stations.

## NETROM/THE NET DECODING

There are some advantages to NodeOPS offered by the SP program.

The password string used at a NetRom/TheNet site can be typed into the SP.NRP file in the same directory as SP. The NodeOP gives the node the "S" command for "sysop" access, it responds with the usual 5-number code, but SP automatically generates the correct response instantly into its transmit buffer. SP then automatically decodes the response you get from the NetRom/TheNet PARMS command into the following display:

### TheNet Parameters:

1:Max-Nodes 49	2:min-Quality 0	3:HF-Quality 192
4:RS-Quality 255	5:Obs-Init 1	6:min-BCast 1
7:Broadcast 7225	8:Lifetime 30	9:T-Timeout 180
10:T-Retry 2	11:T-AckDelay 10	12:T-BusyDelay 360
13:T-Window 10	14:NoAckBuf 10	15:Timeout 1800
16:Persistence 64	17:SlotTime 10	18:FRACK 4
19:MAXFRAME 7	20:L2-Retry 6	21:T2-Timer 100
22:T3-Timer 65535	23:L2-Digi 1	24:CallCheck 0
25:ID-Beacon 1	26:CQ-UI-Frame 1	

At this point the NodeOP simply types:

<ESCAPE> PAR p w

where p is the parameter number and w is the new setting. No more inserting "\*"s to change a parameter on a node.

## HARDWARE REQUIREMENTS

Supposedly SP can manage up to four TNCs plus a DRSI card simultaneously. Each of these can be assigned to a radio on a different frequency. Obviously your computer configuration, (and your budget), may limit this capability. On a typical AT-clone without special attachments, address and IRQ-code conflicts prevent the use of more than two comm ports simultaneously.

DRSI PC\*PA cards do not "use up" comm ports. You can add as many of them as you have slots on your motherboard. You must be aware, however, that no matter how many you have, they will only be recognized as a single TNC by SP. To quote the SP documentation, "A DRSI card is viewed by SP as one TNC, but acts as two TNCs to the outside world, however. This configuration is determined by the driver software and cannot be changed. If multiple DRSI cards are used, they too act as one single TNC". In view of this, the ideal multi-port, multi-frequency, (possibly a gateway), installation seems to be using conventional TNCs alongside a DRSI board. I would be interested in hearing from anyone who has successfully tried a multiple TNC setup with SP. We are hoping for a software revision from either DRSI or DL1MEN that will allow the two PC\*PA ports to function as separate "TNCs" as the AA4RE BBS does.

I have seen SP working on both XT and AT clones. The 286 machine handles the program with much more speed, but the program works fine on either computer. With some files accumulated from on-line use, the program occupies about 500K on my hard drive. This includes an extensive, well-written and updated doc file.

(cont'd on page 11)



## Summer Follies

As summer ends and fall begins most Americans find themselves tired, sometimes sunburned, and often broke from vacation outings. Many of us have taken time to either walk a mountain trail or find a secluded waterway to search for a hungry fish.

Most hams find traveling about the country a pleasant experience finding new repeaters and meeting new radio friends. Most places I have been around the country, are very friendly and the locals are always ready to assist with directions, advise about places to stay and things to do, and chat idly to help pass the time.

It should be noted however that not all repeaters and not all hams are so warm and open to outsiders. On two occasions I can recall, I have not been warmly greeted and signed off with the feeling that it was better to just listen and not talk.

As our hobby has become automated, many of us now travel with small computers, a TNC and handi-talki that allows us access to two meter BBS systems in the various cities we visit. Usually, I have noted this to be a very friendly group of hams, more than willing to assist or visit.

Also, checking almost any local BBS gives the same type messages and traffic as our home system. We have created an almost universal system that is about the same at all locations. There is great benefit in the common systems, but it is a little disturbing to not see more diversity and more innovation from one place to another.

Possibly in the larger metropolitan areas which I try to avoid, there is that diversity; however we are really missing a good chance to advance the hobby further. As I have commented before, the individual QSO, keyboard to keyboard, on VHF packet is not nearly as predominant as it was in the early days of packet. It is not acceptable, to DX the system with multiple digipeats, since the whole setup now is networked and automated. What we need to do is to put our minds to work and come up with some newer and more innovative ways to use packet in particular. If this can be done, it will not only interest more people in ham radio, it will interest more hams in packet and other forms of digital

communication. Besides, it will keep us from becoming stale and bored.

As a group, we are becoming a bit sedentary. Presently, we sit back, buy our gear off the shelf and operate. Few hams make much of their equipment and limit their building to a few cables necessary to connect all the apparatus. Because of the technology required and currently used, we can't keep up and to have the latest, we must buy manufactured gear. All that is just part of the society and environment we have today.

What we can do, however, is to extend the use of the equipment and put it to new uses. We should become innovators in application rather than equipment construction. That means new software for the computers in the shack, new methods of networking and hopefully more ways to extend person to person communication.

Next time you have a few minutes, spend a while thinking about new ways to use all this technology. With all the bright minds we have in ham radio, we should be able to turn on the rig and computer and see new things coming across the screen, not just new traffic.

The summer is also the time when we all promise ourselves and brag to others that we are going to do all that antenna work. As it turns out, it is usually the first cold snap which shakes us to reality and reminds us of the loose connections and wet traps that need repair.

When we started off the season, Field Day was the time we tested our abilities at handling emergencies. As we end the season, that test seems long ago, but hopefully the lessons learned will aid us as the need for emergency communication arises.

This particular summer, many floods and tornadoes have tested some areas of the country. As summer ends, I hear lots of predictions that we will be facing one of the most severe hurricane seasons in recent years. This gets a lot of attention after HUGO.

### EMERGENCY WHAT . . .

A debate could be held and probably not

ever won, about which form of communication is best in emergencies. We are all convinced that most commercial and governmental systems fail in any real disaster, while ham systems at least can be quickly patched together to provide the necessary communication.

Since I reside near the Gulf of Mexico, the most common emergency communication familiar to me are the various nets related to Hurricane warning and subsequent relief traffic.

I can recall many times, sitting quietly, listening to stations in the middle of hurricane force winds and sometimes in the actual eye of the storm. They described conditions. It was not only valuable communication for the weather forecasters, it was real human drama; not just a television plot. In this case, voice communication was very effective. I understood, the weather bureau understood and it was efficient. If a word or sentence was lost due to poor propagation, a fill was requested and solid copy resulted.

Not meaning to be insulting to CW or Packet, you cannot substitute for direct voice communication in an emergency. One person talking can communicate more quickly and effectively than a thousand computers. All the baloney about letter perfect copy and transmission means nothing when the house is burning down; all you want is to yell 'FIRE!'

It has been my contention for some time that packet systems are not very effective emergency communication systems. They result from replication of commercial systems that often fail in any real disaster. Likewise, our entire VHF packet system is based on networking and as links go down the system can deteriorate rapidly. Besides all that, there is no way a computer and modem can communicate the inflection and emotion of the situation. The human voice will always be the best form of person to person communication. We now can use digital transmission of the voice, and it will be interesting to see how the digital version of 'FIRE' comes out.

### PACKET RACKET . . .

So that I don't offend, let's look at where digital transmissions do really do a great job. That is after the emergency is over and lots of traffic needs passing. Maybe it is health and wel-

(cont'd on page 13)



(cont'd from page 9)

## FIRMWARE REQUIREMENTS

Every commercial TNC you buy today has its own "firmware" to run the internal micro-processor, control the memory and provide a useable interface to your terminal or computer. The 27256 eeprom in one of the IC sockets in your TNC contains this program. Eskay Packet, like the AA4RE BBS and the THS terminal program, needs to talk to the "host mode" of the WA8DED firmware. The SP package comes with an enhanced version of this firmware, called TheFirmware, written by the German NORD<>LINK group. For SP to work, you must replace the eeprom present in your TNC with one that has been burned with either one of these programs. The alternative is to use a DRSI PC\*PA internal card which comes equipped with WA8DED firmware.

NORD<>LINK has a version of the WA8DED code for the AEA PK-87/88 and the PacComm TNC220 and these eeprom images, as well as one for the TNC2 clones, are included with the SP package. This gives you a great deal of flexibility in running the program, especially if you like to work HF packet.

## TRY IT, YOU'LL LIKE IT

At first glance, SP seems a lot of trouble to get going. First you have to get a new eeprom burned, then you have to spend some time with the program to get it to fit your particular setup. The configuration file is quite long and detailed. After running it for a while, though, I can safely say your hard work will be rewarded. It is a superior program for those interested in a packet only setup. The folks around Florida who have tried it agree with me.

If you would like a copy of Eskay Packet V4.00, you can send me a formatted 360K or 1.2Meg 5-1/4" floppy disc and a pre-posted, self-addressed disc mailer, all inside another envelope. Unfortunately I cannot be responsible for insufficient postage not getting the mailer back to you, so please attach enough. Also I would ask that you please be patient as I have a full-time job that takes priority. The documentation included with the program tells you a way to get current updates directly from the author, Sigi Kluger, DL1MEN, in Munich.

I did not go over all the SP features that one would normally expect of an IBM-compatible

terminal program, like capture files, macros, link-hold timer and TNC control. This article was just a "teaser". And I do not pretend to be an "expert" on SP. I only wrote this in the hopes of starting a nationwide dialogue on the fine points of this great software. Please send me E-mail if you have comments, corrections or additions to the above. I will try to disseminate the new information I receive from users.

Craig Rader,  
N4PLK @ WD4HIM.#ORLFL.FL.USA.NA  
(Compuserve 72040,2216)  
922 Baltimore Drive,  
Orlando, FL 32810-5531

(cont'd from page 3)

installation, including testing and calibration, is priced at \$130.00. The 2400 baud option plus the PakMail option is priced at \$200.00. All prices include domestic shipping. (International owners should check with their local distributor.) Do not order until one of the

following requirements are met: Warranty-registered owners will receive order forms. Un-registered owners should write to: Advanced Electronic Application, P.O. Box 2160, Lynnwood, WA 98036.

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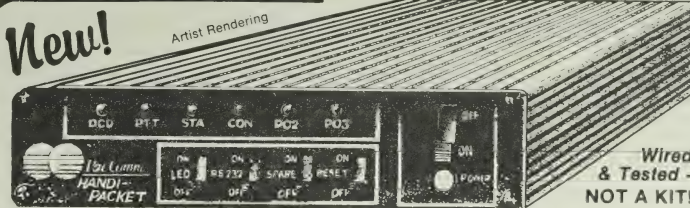


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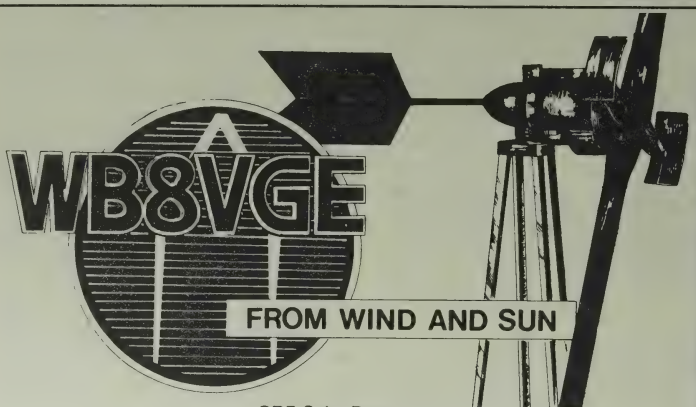
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## Solar Power



QRP Solar Power

Mike Bryce, 2225 Mayflower NW, Massillon, Ohio 44647

If you have been following the Digital QRP, you'll notice by now I'm a real go getter for alternate energy, especially solar power. This month we'll look over some of the basics for making solar cells and explain some of the ins and outs of solar power. With little exception, all photovoltaic cells are made of silicon, the second most common element on this planet. There is one small problem, the silicon must be a required purity.

The best source of silicon is silica, or common sand. To produce a solar cell, silica is melted and a controlled amount of carbon is added in a batch process. The carbon reacts to remove the oxygen as carbon dioxide, leaving relatively pure silicon. The silicon cools into a block or ingot. At this stage we have commercial grade silicon. We can't make solar cells yet as the silicon still has impurities. Converting this commercial grade silicon to semiconductor-grade is very expensive. All impurities must be removed. During the cells manufacture, small amounts of dopants will be added to the silicon. Impurities upset the delicate electron structure that exists between the atoms.

Through a process known as the Siemens process, very pure compounds of silicon are reacted with an electrically heated seed rod. Ultrapure silicon is slowly deposited on a cherry-red rod to form an ingot weighing about 200 pounds. This ingot is now known as

polycrystalline silicon, or polysilicon. The Siemens process has been used for over 20 years.

The next step is to produce single crystal in block form. This is done by re-melting the polysilicon in a special furnace where the temperature is carefully monitored. The Czochralski process, a seed crystal of silicon on a holder is dipped into the melted polysilicon and then very slowly drawn upward. When I mean very slow, we're talking about one inch every three hours. The molten material starts solidifying on the seed crystal, following the identical crystalline pattern, making a clone if you will. Some of these crystal ingots can be formed 6 inches in diameter and up to 36 inches long. The going price for one pound of Czochralski produced crystal is about \$200.

When the crystal has cooled, the next step is cutting the ingot into thin sheets or wafers. Various techniques have been used in the cutting or sawing process. Among those are: multi-bladed circular saws, wire saws and diamond abrasives.

Doping of the wafer to create the two layers required for photovoltaic use is accomplished in two steps. A trace chemical, usually boron, is added to the molten silicon and thoroughly blended in. This makes the ingot all p-silicon. When the wafers have been cut, they are

coated on one side, then passed through a furnace containing a vapor of phosphorus for just enough time to allow the phosphorus to diffuse a short distance into the silicon, creating a very thin n-silicon layer. Metal contacts are then applied to both sides of the cell. We now have a working photovoltaic cell.

The photovoltaic industry has been using this method to make cells for sometime. There are several different methods which have also proved very successful.

Photovoltaic cells can be made in sheets, avoiding the cost of the pulling and cutting of the ingots. These two processes are called; ribbon and dendrite.

In the ribbon process a shaping guide or die, that has a thin slit through the center, is lowered into a pool of molten silicon. As the molten silicon is drawn up through the slit by capillary action, a seed crystal is touched to the melt at the top of the die. As the silicon leaves the die, it slowly cools into pure crystalline form following the pattern established by the seed. The silicon ribbon is about 4-5 inches wide and is wound up on a drum. The ribbon is then doped, cut to length and surfaced as in single crystal cells. Since the resulting cells are rectangular, more power per square foot of panel is possible over the round single crystal cells. The Mobile RA series photovoltaic panels are made using this process.

The dendrite process is about the same, only there is no die or guide. Two special seed crystals called dendrites are placed into the molten silicon and pulled out together at a very slow rate. The crystals are pulled out and up from the molten silicon and a sheet of silicon crystal is grown between the two seeds.

The third method is called polycrystalline silicon. Much work has been done by Solarex Corporation on this technique. Pure silicon is heated to about 2,000 deg F and then poured into a special crucible or pot. The material is then allowed to cool and solidify in a controlled manner. The resulting ingot is composed of individual crystallites that are quite large. The ingot is then sliced and treated as single crystal cells.

There are of course several other methods to make photovoltaic cells. However, these three

(cont'd on page 19)



(cont'd from page 10)

fare, maybe it is commercial or government inquiry or assistance. Phone has always been notorious for lousing up messages. Every operator has the potential for making a change in the text, not under-standing or translation. All this can easily lead to some misstatement. It has been all we have had, but no longer. Now we can let the computer take the text and for sure and by golly, letter for letter, deliver the exact duplicate at the end destination. That is just as good as any commercial system and we have it available during any post emergency.

After any crisis, I say we should focus on packet. In addition, there is another function that digital communication can do best. Before an impending emergency, one that is known like a hurricane, digital communication can accurately and widely disseminate the information necessary for planning. The Weather Service no longer broadcasts as many bulletins on RTTY, but using a combination of RTTY, NAVTEX and Packet, hams can provide their local area with very accurate data for planning. The latest bulletins are available in real time and without operator translation.

In the past, trying to pass bulletins, storm positions and the like have suffered greatly for operator error. Often, those who want to be helpful share what they last heard which may be outdated or incorrectly noted. Digital is by far the best for passing this pre-emergency information.

#### DIT DAH . . .

When is morse code at it's best? Many think never, but that is not true. My opinion is that CW has some of the benefits of phone. Solid copy is not necessary to communicate. Unlike phone and unlike digital transmission, poor propagation can be overcome by the human ear. The SOS faintly heard, can be relayed to someone who can help. Likely voice communication and for sure digital transmissions would never have been heard. CW requires only a small frequency window and any good operator can pull out something from the weakest signal; even one with a chirp!

It may be interesting to see is how long CW can survive this top spot in weak signal communication. Now that ships at sea are becoming automated and may no longer have radio operators, and now that we are

downgrading our requirements for CW as a requirement for a radio license, will we have enough good operators on the frequency? Will there be enough CW interest and activity to make it viable? Will the person needing to communicate even be able to use CW? All these questions will be answered in the future, but for now CW still has a very strong benefit.

#### REALITY . . .

All these comments are meant to focus on the fact that digital communication is not the answer to all things. Although some would lead us to believe that our networks are the best thing since apple pie, it is not so.

The systems we now have are well conceived, maintained by a lot of devoted sysops, and very valuable. They are not the answer to all our emergency needs. If I find myself on a sinking ship I prefer a good HF rig with a microphone or at least a handy key. Besides, there are not many repeaters or BBS systems in middle of the North or South Atlantic.

#### DSP vs ESP . . .

Anacronyms are a favorite of government employees and now hams have their own. To Digital Signal Processing (DSP) I would like to add Ear Signal Processing (ESP). As it turns out, ESP is what we have been doing all these years without knowing it and without an anacronym to define it. The human ear is not a part of digital transmission, but it is invaluable on phone or using CW. Perhaps, we have reached out limit in developing ESP, but not so DSP. Once again, technology charges forward.

Digital Signal Processing is another example of what the computer can do for us. As I have proposed in the past, it makes a lot of sense to use the power of the personal computer to in lieu of products with EPROM coded software. I hope as DSP becomes more widely used, and we all are exposed to the notion, we will see more applications via personal computer software. Who knows? DSP may even reach the heights of ESP!

#### TEASER OF THE MONTH . . .

My friend, to whom I often refer, has just come by and informed me of a new sport

among hams. Digital Volleyball!

As he explained it, many hams are not into golf or tennis and quite a few are a little overweight and out of shape. Presumably, one of the latter was looking for some exercise to help rectify his condition. The result was the new ham sport of Digital Volleyball.

Some of the terms are not exactly the same as regular volleyball. For instance, the term NET is different. Whereas in regular volleyball you try to hit a ball over the net, in digital volleyball you try to get the ball through the net.

The ball mentioned previously is also quite different. It is not round, but linear and may be no longer than PACLEN. Each player has his own version of the ball which carries his identifier. If he is successful in getting the ball through the net then the object is for the other player or players to field it and get it back as soon as possible.

The bounds used in the digital version, really are only frequency. It is unfair and not in the rules to allow any alternate frequencies or bands.

The point is scored in favor of the last player or team to successfully get the ball through the net. Obviously, it cannot go out of bounds and be legal.

My friend, who is himself slightly pudgy, has been playing the new sport and swears he has lost 10 pounds in just two weeks. If you get a chance to play, please let me know the results. ☐

*If you have news or information of interest to the digital amateur radio community, please let us know!*

(cont'd from page 5)

resulting program easier to use and allows innovative software to greatly expand the user interface. The AA4RE BB program uses host mode to provide good multi-user capability with the AEA TNCs and those which can use the WA8DED host mode firmware.

If you would like more information about user software which uses host mode, drop a note to InterFlex Systems Design Corporation, P.O. Box 6418, Laguna Niguel, CA 92677, or call (714) 496-6639 during business hours.



## Potpourri

The Amiga community has been lucky recently - there has been a very strong upswing in activity on many fronts. We've had several new Amiga models released by Commodore (and yet another rumored to be immanent), a new version of the operating system has found it's way to market, and there are a number of significant new products that have made very successful debuts.

### — New Machines

Until recently, the Amiga family has been moderately small; we've had the original machine, the a1000, as well as the a500, a2000, a2500/20 and a2500/030. A nice group, to be sure, but more would be nice. Well, they're here!

First, we have the Amiga a3000, a 16 or 25 Mhz powerhouse that has a very compact "desk footprint" while still turning in a respectable 7 MIPs or so (only a i486 machine runs faster than this in the desktop market). A 25 Mhz 68040 CPU board has been shown that runs in the range of 22-27 MIPs - this is twice as fast as an i486, and faster than many minicomputers.

Next, Commodore's "Baby", the CDTV machine has been introduced. This machine's initials stand for Compact Disk TeleVision, as near as I can make out. It's got the soul of an Amiga 500, and a heart made from a CD player. This machine is meant to be run from an infrared remote, although you can add a keyboard and so on until it really is a 500 series machine. It's to be sold in retail stores to the unwashed multitudes to provide them with the ability to read encyclopedias, take guided interactive tours of museums, view tutorial material of various natures, and so on. It's quite the hot machine - we'll have to see what the support from the technical community is as far as CD and software products for it. Internally, it's a one megabyte machine with the new Amiga chipset, meaning it has the 1200 pixel per line hires capability, as well as the Amigas standard 4096 color range.

The a3500 is rumored to be in the chute for release; this machine is rumored to essentially be an Amiga 3000 in a "tower" case, providing a heavier power supply and more slots for expansion. You never know about

rumors, though - I've also read in one of the "mainstream" Amiga magazines that the 3500 is supposed to come with a 25 Mhz 68040 as the brains... if so, great - but that's not what I hear.

With all this new hardware things are really looking up; but there is a lot more that's going on which is of great interest. Commodore isn't the only ones who have been working on hardware...

### — Accelerators - really fast ones!

Several manufacturers are now offering 68030 based accelerators running at speeds up to 50 Mhz. A 50 Mhz 68030 is roughly as powerful as the fastest i486; not bad at all. Manufacturers involved in this type of development include Supra, GVP and Imtronics. Things are getting pretty hot in the speed arena, folks!

### — Erasable, Rewritable Optical Disk Drive

XYXIS Corporation has introduced an Erasable Optical Drive with 600 megabyte removable media capacity. They say it works with the Amiga 500, 2000, 2500 and 3000; Also that it is compatible with the 2091 SCSI adaptor. You can contact these people at (612) 949-2388 for more information on this high capacity storage system for the Amiga.

### — Really fast hard drives

At the Chicago AmiExpo not one but two hard drive companies were showing hard disk systems that were fast enough to read video off a the disk at 60 frames per second - the same speed as std video. Both manufacturers were showing "video loops" coming live off a hard disk, an extremely impressive demonstration of raw disk transfer speed.

### — More color capability

Black Belt Systems (where I work) has released the HAM-E, a video adaptor for any Amiga which adds two new video modes. The first mode provides a simple 256 color palette like a VGA system does, except the palette is 24 bits instead of 18, like a VGA. The other mode provides 18 bit color - 262144 simultaneous colors on screen at one time! The adaptor runs in interlace or non, over-

scan or non, and works with both PAL and NTSC Amigas. It works on the standard Amiga monitor, too - the new video modes appear as standard Amiga screens and can be pulled up and down, and pushed front to back and vice-versa just like normal Amiga video modes. If you're interested in finding out more about this device, give us a call at (800) TK-AMIGA. It's FCC approved, by the way.

### — A Spicey delight

From the public domain side of things, a new version of Amiga "Spice" has been released. This is a program that allows simulation of analog circuitry on your Amiga. By all accounts it's quite the tool for those engaged in analog design, and should be of great interest to HAMs in general. You can pick it up in many places, one I know of is Compuserve's Amiga Tech Forum.

### — AutoRouter

Back to Black Belt Systems for another item of interest to HAMs; We have brought out a full autorouter for our printed circuit board layout package. It's a free upgrade if you already own the PCB layout tool, and comes with it for new purchasers - the purchase price of Board Master has not been changed, either. The PCB tool is called "Board Master", and it's under \$100, something tailored for the frugal HAM operator. We're really pleased with our layout package, and do all of our hardware design and manufacturing with it. The new autorouter is really fast - on our 25 Mhz Amiga 2500/030, it routes a complete SCSI interface adaptor for the Amiga's ZORRO bus in one minute and six seconds. We include this design with the autorouter so you can see for yourself. Board Master supports output formats for excellon drill tapes, Gerber photoplotters, Hewlett Packard plotters, Houston Instrument plotters, IFF screen dumps and more.

### — Satellite Tracking

NH Enterprises is offering AMIGAttrak, a satellite tracking program in the commercial market. AMIGAttrak takes the satellites name and the usual tracking data and plots the satellites location on a world map, providing longitude, frequency of beacon (if any), elevation when the satellite is in range, and the time. It includes the ability for voice readout and supplies routines for scheduling and acquisition of signal windows.



## - A Game. A Game? Yes!

Normally, I keep pretty quiet about games. Don't play very many of them, and when I do it's usually a simulator of some kind, like a flight simulator or something on the order of SimCity, a population and city management scenario game. But I've got to mention this one.

First, let me tell you that my family background is very heavy in science fiction. Although I've not (yet) been involved on the writing side, my family's credits include several writers, a literary agency, and a translation (french) service. All of this is in the science fiction field, too. Me, while I don't participate in the generation of SF, I do read it - constantly. One of the best books I have ever read, possibly the best book I have ever read, is "Neuromancer" by William Gibson. It reads like a tapestry, and contains provoking new ideas in a milieu where no respect is given to traditional hero and antihero roles. A real work of art.

Now there is a game called Neuromancer. Pish, sez I. Tosh. Phooey, even. But now I repent. The game itself is a wonderful implementation of the environment that Gibson wrote about, necessarily cartoon-like but still complete in most important details. If you read the book, you'll see how difficult this would be to do! I've not been able to finish the game yet (it is difficult!) but I'm extremely impressed with the work these people have done. Definitely worth the price, unlike 99% of the trash out there. Neuromancer is not copy protected, either. Score a big one for the publishers. You can put it on your hard drive, and you don't need to worry about losing it to a disk crash.

## - Amigavision - Multimedia with class!

Commodore has released the first software product with their name on it that is worthy of the appellation class software. Amigavision is an authoring system that helps you to make really nice presentations, tutorials and more using virtually all the Amigas powerful facilities. You can have sound, speech, animation, still images or slides, and lots more all combined into an effective presentation. Until now, the only really effective way to do this was with either the Director from the Right Answers Group which is a rather technically oriented product that is difficult to learn and even more difficult to use effectively, or CanDo from Innovatronics which is nice, and also easy - but doesn't really compete with the

professional Amiga Vision interface and slick performance.

A product like this tends to scare away users by claiming to handle everything in one fell swoop - the average user has been scared off by previous product like UltraCard that proved difficult to use and often buggy as well. It's a well deserved feeling, but take my advice and don't assume Amiga Vision is this way! It's really, really easy to use, and it's not buggy at all, at least that I've been able to determine.

Amiga Vision is a tool that helps bring all the Amigas capabilities together at one time; something that very clearly shows the machines superior capabilities off - easily.

## Something for the physically handicapped

Some individuals are unable to manipulate a computer's keyboard, and so have been locked out of the wonderful intellectual experiences a computer can initiate and enhance. The irony of this is that a person who has limited physical capacity is often the one who most enjoys and even needs to explore the mental realms of life.

Black Belt Systems has created a tool for these individuals. It's free, as this particular group also tends to be limited financially. The tool is called the "JakeBoard", after the young fellow it was initially designed for, and provides a complete keyboard on screen which can be run from a mouse, trackball or touchpad. What's unique about this is that it works with virtually every piece of serious software there is for the machine; spreadsheets, databases, and so on. It also works with the IBM XT and AT bridgeboards you can install in the 2000/3000 series machines, so all of that software is now usable as well! This is something that is almost impossible to do on any other computer besides the Amiga. The interface is smooth and seamless, and provides ALT, Control, Shift, CAPSLOCK, and so on so that any function can be accomplished with a minimum of effort from the user.

The JakeBoard is available of Compuserve in the AmigaVendor forum, in data library six. If you know of a handicapped person, get a copy of this and show them what they can do.

## - Coming Attractions

We can't speak for other manufacturers, but Black Belt has several items planned which should be of great interest to the HAM com-

munity. One is an extremely high-powered schematic generation system that will operate in conjunction with our layout system and autorouter. Another involves packet, and I'll tell you more about that next month. Do you know of any Amiga news of interest to the HAM community? Send it to me c/o Black Belt Systems, 398 Johnson RD, Glasgow, MT 59230 and I'll take a good look at it for you; I'll note all the interesting stuff we can find! ☐

## RTTY-PC Program...

RTTY-PC is an easy-to-use, multi-featured communications program for either receive-only or two-way RTTY/ASCII communications via Amateur Radio. It will send and receive RTTY (Baudot) at 60, 66, 75 and 100 wpm, or ASCII at most standard (and some non-standard) speeds between 110 and 9600 baud. By means of a suitable computer, interface and radio transmitting and receiving equipment, you can communicate with other Amateurs operating RTTY or ASCII. You can also use the program just to receive other stations. This can include Amateur and non-Amateur stations.

The program "comes up" receiving RTTY on the band to which your receiver is tuned. It is not necessary to go through a lot of menus or answer a lot of questions each time you run RTTY-PC, like some programs require. But, with a touch of a key, you can exit the main receive/transmit screen and get into the menus.

The main screen you'll see is "split" into two windows: The upper window shows actual received and transmitted text (in two different colors or intensities) and the lower window "stores" the text to be transmitted as you type and can be used to view and change messages. The two windows are separated by the Divider line, which displays the mode, speed, date, time and other information.

RTTY-PC has a Type-ahead buffer: You can type your reply to the other station even while receiving him, interspersed with messages and disk files if desired. The program featuring 12 1024 character message buffers. You can send one of these 12 messages, each one up to 1024 characters in length, with the touch of a function key. These messages could include CQ, a description of your station equipment, your name and QTH, the

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## Landline Telecommunications - Part III

This is the final installment in a three part series on telephone based telecommunications. In Part I, I introduced the subject of landline telecommunications with a discussion of equipping your microcomputer for telephone modem use. Part II continued this discussion and introduced the CompuServe on-line service. A quick look at the HamNet forum on CompuServe finished up Part II. In this issue, I'll wrap up the discussion of landline telecommunications (at least for now) with some updated advice about modems and a look at several amateur radio related BBSs (Bulletin Board Systems) that you can "login" to right away.

### Modems

As I mentioned in Part I, I presently use an Everex 24E external 2400 baud modem with MNP level 3. I discussed the MNP error correction system in some detail in Part II. In this section, I want to sum up my feelings regarding the importance of MNP in your modem decision making process.

The important point to keep in mind regarding MNP is that it serves no purpose if the modem on the other end of the line is not MNP compatible. MNP works only when connected to another MNP system. But, when two MNP systems are connected, MNP does an excellent job of reducing errors and increasing throughput.

Another point to keep in mind is that often MNP level 5 2400 baud modems will be advertised as 4800 baud modems. This is due to the fact that at MNP level 5 data compression, twice the amount of information is sent - so a 2400 baud signal can transmit 4800 bps. When not connected to a MNP level 5 system, the modem acts like a regular 2400 baud modem.

However, two MNP systems with different levels of implementation will still take advantage of the highest MNP level available to them. For example, if I were to connect to a level 5 MNP modem, the level 5 MNP modem would fall back to level 3 MNP, the highest level my modem is capable of.

Yet another twist in the MNP saga is the emergence of MNP in software. Using a MNP software implementation, it is possible to use a regular, non-MNP modem to communicate with a MNP system with the full advantages of an actual MNP modem. Presently, the only MNP software system I know of is the MTEZ communications software from MagicSoft.

I received the MTEZ software with a 2400 baud internal Toshiba modem that I purchased for my laptop. I have not tired it yet - I'm a big fan of ProComm Plus - but, theoretically at least, there are some advantages to using a MNP software emulator rather than purchasing a MNP modem. The big disadvantage is, of course, that you will only be able to take advantage of MNP while using the terminal software supported by the MNP software emulator. If you have any special purpose telecommunications software, you're out of luck when it comes to MNP with a MNP software emulator.

If you know that you will communicate regularly with MNP compatible

systems, it makes sense to purchase a modem with built-in MNP capabilities - preferably the full level 5 implementation. Keep in mind that MNP systems are not all that common, although more and more are popping up. If I were buying a new modem, I'd definitely purchase one with level 5 MNP - just to be on the safe side. However, if you already have a 2400 baud modem and don't think you'll need MNP all that often, I'd look into the MNP software emulation option.

Two good, low-cost level 5 MNP external modems are made by Everex and Practical Peripherals. My Everex 24E with level 3 MNP has been upgraded to full level 5 compatibility. The Practical Peripherals PM2400SA MNP is also an excellent choice. If I were starting from scratch, I believe I'd get the Practical Peripherals modem - but shop around before making a decision. Both modems sell for about \$200.

### ARRL BBS

The first BBS I'd like to discuss is the ARRL Field Service board. It can be reached at (203) 665-0090. I accessed it at 2400 baud, 7 bits, even parity, and 1 stop bit. This board contains a lot of good, relevant information about most all aspects of amateur radio. Rather than describe it in words, what follows are selected excerpts from my session on the board.

CONNECT 2400

\* Network Address 1:142/670.0 Using BinkleyTerm  
Version 2.30  
Press <Escape> to enter BBS.

WILDCAT! Copyright (C) 87, 88 Mustang Software. All  
Rights Reserved.  
Registration Number is 89-0385. Version 1.13  
Registered.

Connected at 2400 baud.

What is your First Name? Jonathan  
What is your Last Name? Mayo  
Looking up Jonathan Mayo... Please wait.  
Password: \*\*\*\*\*

Good morning, Jonathan.  
You are the 10,887th caller.

You last called on 07/05/90 01:14.  
This is your 2nd call.

Running 300, 1200, and now 2400 Baud!  
Open 5 pm until 8 am Monday through Friday  
and all weekends and holidays



# MAIN MENU:

[M].....Message Menu [F].....Files Menu  
[C]....Comments to the SYSOP [B].....Bulletin Menu  
[P].....Page the SYSOP [I]...Initial Welcome Screen  
[Q].....Questionnaire [V].....Verify a User  
[Y].....Your Settings [U].....Userlog List  
[N]. ARRL BBS newsletter [G].....Goodbye & Log-Off  
[H].....Help Level [?].....Command Help

You have been on for 0 minutes, with 45 remaining for this call.

MAIN MENU: [M F C B P I Q V Y U N G H ?] >> f

# FILE MENU:

[Q].....Quit to Main Menu [I]....Information on a file  
[L].....List available Files [D].....Download a File(s)  
[U].....Upload a File(s) [N].....New Files since [N]  
[T].....Text Search [S]....Stats on Up/Downloads  
[F].....File Transfer Info. [G].....Goodbye & Log Off  
[H].....Help Level [?].....Command Help  
[M].....MESSAGE SECTION [V].....View an ARC file  
[R].....Read a TEXT file

You have been on for 1 minutes, with 44 remaining for this call.

FILE MENU: [Q I L D U N T S F G H ? M V R] >> 1

Area(s) to list [Type '?' for selections] : ?  
Files areas available:

[A] - UPLOADS	[B] - IBM PROGRAMS
[C] - UTILITIES	[D] - SYSOPS FILES
[E] - GENERAL	[F] - BULLETINS
[G] - ARRL SECTIONS FILES	[H] - NEWSLETTERS
	AND RELATED FILES
[J] - EMERGENCY COMMUNICATIONS AREA	[K] - AMATEUR RADIO
	EQUIP 4SALE
[L] - LOST/FOUND/STOLEN	[M] - THE AMATEUR SATELLITE
	SERVICE

Area(s) to list [Type '?' for selections] : m

Listing : [M] - THE AMATEUR SATELLITE SERVICE

9600-SAT 2,548 04/14/90 | World's FIRS 9600 bauds  
contact via  
DwnLds: 2 Trans Time 00:00:14 | an Amateur Radio  
satellite!

AMSATN.132 10,130 05/15/90 | Amsat news bulletin for  
day 132  
DwnLds: 8 Trans Time 00:00:54 |

ANS-069.03 2,587 03/11/90 | AMSAT method of orbit  
data presenta-  
DwnLds: 4 Trans Time 00:00:14 | tion change being  
considered

ANS-062.07 2,719 03/09/90 | AMSAT bulletin 062.07,  
UO-14 status  
DwnLds: 7 Trans Time 00:00:15 | report.

ANS-062.08 1,967 03/09/90 | AMSAT bulletin 062.08,  
UO-15 status  
DwnLds: 9 Trans Time 00:00:11 | report.

ANS-069.05 2,309 03/11/90 | Microsat News March 10th  
DwnLds: 6 Trans Time 00:00:12 |

DECODE.SAT 2,432 02/19/90 | W3IWI talks about decoding  
the MICROSAT  
data  
DwnLds: 13 Trans Time 00:00:13 |

DELAY 1,714 05/13/90 | STS/SAREX shuttle mission  
delayed  
DwnLds: 8 Trans Time 00:00:09 | until June.

DETAILS 8,704 05/13/90 | Complete (more than you  
ever wanted  
DwnLds: 12 Trans Time 00:00:47 | to know) details of  
SAREX mission

DOVETLM.FMT 5,306 02/07/90 | DOVE telemetry  
description file.  
Under  
DwnLds: 26 Trans Time 00:00:29 | stand those 145.825 Mhz  
transmissions!

DOVE128.LNX 25,984 02/10/90 | Corrected Version 1.1  
- decode DOVE TLM  
DwnLds: 15 Trans Time 00:02:20 | Channels 39-50-50 now  
corrected 2/10/90

DOVECR.ASH 2,455 03/19/90 | DOVE satellite has onboard  
computer  
DwnLds: 6 Trans Time 00:00:13 | crash, subsequently  
repaired.

FILING.TLM 1,383 03/03/90 | N4SCY talks (types) about  
how he sets  
DwnLds: 4 Trans Time 00:00:07 | up his DOVE telemetry  
files.

FO20SKED.MAY 712 05/13/90 | Fuji OSCAR 20 satellite  
in  
DwnLds: 1 Trans Time 00:00:04 | J-analog mode until  
further notice

FREQS.SAT 1,813 03/17/90 | Microsat/Pacsat frequency  
updates  
DwnLds: 14 Trans Time 00:00:10 |

MICROSAT.PIX 2,432 02/19/90 | WEBERSAT photographs  
being taken from  
DwnLds: 24 Trans Time 00:00:13 | space!

NK6KTL.ARC 55,424 01/25/90 | Decode the MICROSAT  
telemetry!  
DwnLds: 47 Trans Time 00:04:58 |

ORBS-153 4,224 06/05/90 | OSCAR and MICROSAT  
Keplerian data,  
DwnLds: 4 Trans Time 00:00:23 | June 2 1990

ORBS-069.0 4,237 03/11/90 | March 10th OSCAR  
satellite orbital  
DwnLds: 7 Trans Time 00:00:23 | elements.

ORBS-097 3,840 04/14/90 | April AMSAT Keplerian  
data for tracking  
DwnLds: 7 Trans Time 00:00:21 | of amateur satellites  
- includes micros.

OSCAR15.HLP 2,481 02/07/90 | Oscar UO-15 needs your  
help!  
DwnLds: 3 Trans Time 00:00:13 | (packet bid ANS-037.08)

(cont'd on page 18)



Press [ENTER] to continue...

#### FILE MENU:

[Q].....Quit to Main Menu [I]....Information on a file  
[L]....List available Files [D].....Download a File(s)  
[U].....Upload a File(s) [N].....New Files since [N]  
[T].....Text Search [S]....Stats on Up/Downloads  
[F].....File Transfer Info. [G].....Goodbye & Log Off  
[H].....Help Level [?].....Command Help  
[M].....MESSAGE SECTION [V].....View an ARC file  
[R].....Read a TEXT file

You have been on for 4 minutes, with 41 remaining for this call.

FILE MENU: [Q I L D U N T S F G H ? M V R] >> q

### Wayne's World

We all know Wayne Green as the publisher of 73 Magazine. Many of us are also aware that he publishes several other magazines. This BBS, known as Wayne's World, serves as an electronic meeting place for persons interested in any of the subjects Wayne's interested in - including amateur radio. Wayne's World can be accessed at (603) 525-4438. I accessed it at 2400 baud, 7 bits, even parity and 1 stop bit. Once again, I've reproduced excerpts from my session online below.

Welcome, then, to WAYNE'S WORLD!

LIVE! From Hancock, NH 03449! You have 100000 credits!

The following services are available:

T ... Teleconferencing  
I ... Information Center  
S ... SIGs (Special Interest Groups)  
C ... Classified ads  
E ... Electronic Mail  
A ... Account display/edit  
P ... Polls & Questionnaires  
R ... Registry of Users  
X ... Exit (terminate session)

Please select one of the letters shown, and then press RETURN: i

The following system information is available:

0 => User-IDs of users recently logged off  
1 => User-IDs of users currently online  
2 => Nature of the underlying system hardware  
3 => Nature of the underlying system software  
4 => GALACTICOMM corporate data  
5 => How to buy "live" time on this system  
6 => Set up your own GALACTICOMM BBS

Please enter a number from 0 to 6, or X to exit: 2

This system runs on a standard PC/XT. The key piece of equipment that makes it possible is the GALACTICOMM BREAKTHROUGH, Model 2408: an 8-modem card that plugs into any PC, PC/XT, or PC/AT backplane. This one card contains 8 separate modems, each of them capable of running at 300, 1200, or 2400 baud.

Our particular system configuration happens to be a "Turbo" PC/XT system

from MP Computer Solutions, although any standard PC, XT, AT, or 386-compatible will run The Major BBS. We have a 72MB hard disk (most of which remains empty), and a single low-density floppy drive that we use for backups. We are using an EGAWONDER display card from ATI Technologies, and a Tatung CM-1383F color monitor (but any standard monochrome or color display card and monitor will work).

The connection to the phone lines is accomplished by means of a cable which attaches to the back of the Model 2408... the other end of the cable breaks out into 8 separate male RJ-11 modular plugs. These plugs go directly into the RJ-11 modular jacks installed by the telephone company. We use a "hunt-grouped" set of phone lines, so that several modems can be accessed via a single phone number.

Enter a number from 0 to 6, or ? for menu: ?

The following system information is available:

0 => User-IDs of users recently logged off  
1 => User-IDs of users currently online  
2 => Nature of the underlying system hardware  
3 => Nature of the underlying system software  
4 => GALACTICOMM corporate data  
5 => How to buy "live" time on this system  
6 => Set up your own GALACTICOMM BBS

Please enter a number from 0 to 6, or X to exit: x  
Exiting Information Center, returning to main menu...

Please select a letter (T,I,S,C,E,A,P,R,X, or ? for menu): ?

You are logged in to WAYNE'S WORLD.

You are looking at the system Main Menu. We support a wide variety of online services -- please feel free to select any one you like.

The following services are available:

T ... Teleconferencing  
I ... Information Center  
S ... SIGs (Special Interest Groups)  
C ... Classified ads  
E ... Electronic Mail  
A ... Account display/edit  
P ... Polls & Questionnaires  
R ... Registry of Users  
X ... Exit (terminate session)

Please select one of the letters shown, and then press RETURN: s

Problems are only opportunities in disguise.  
-- Alfred North Whitehead

Your current SIG is /Hello: Questions and Answers about this BBS

R => Read bulletins  
W => Write a bulletin  
D => Download a file  
U => Upload a file  
T => Teleconference  
S => Select a new SIG  
X => Exit from SIGs

(cont'd on page 30)

(cont'd from page 12)

methods are the most popular in use today, with one exception, the amorphous silicon cell, the new kid on the block.

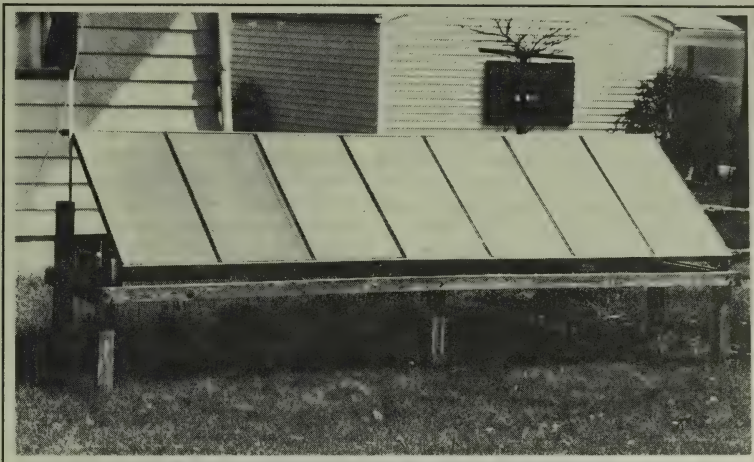
Thin Film Silicon or TFS, micro thin layers of silicon are deposited directly on glass or other material to create a power producing cell. TFS can absorb sunlight in a thickness that is 100 times less than previous technology and has the potential of being 100 times cheaper.

Amorphous silicon, which differs from the crystalline silicon used in the other methods, in that its atoms are arranged at random, instead of in a lattice structure. Most solar powered consumer products, including calculators, watches and even radios are powered by amorphous cells. Right now TFS can convert about 8% of the sunlight into electricity. Since the conversion is lower than that of the single cells, most TFS panels are physically larger to produce the same amount of power. A TFS cell is made by depositing a micro-thin layer of amorphous silicon on a sheet of glass (or stainless steel). The silicon is then exposed to various levels of chemical processing to create the n-side and p-side of the semiconductor junction. Unlike conventional solar panels, which the individual solar cells must be wired together by hand, the TFS cells are connected together by a thin grid.

This grid is made of tin and is laid down on the inside surface of the glass prior to the deposition of the amorphous silicon. When the silicon is deposited on top of the tin, the photovoltaic junction is formed. A second mask of tin is applied to the top and you now have a working TFS solar panel. The ARCO Genesis panel was the industry's first high-powered thin-film photovoltaic module. It produces 5 watts in full sunlight.

No matter how the cells are made, when light strikes the surface, electricity is produced. A typical 4-inch cell can produce about 1 watt of electricity.

After the cells are made, the next step is also very important, cell mounting. The individual cells are connected in series until the desired voltage is reached, about 18 volts. The cells are then mounted on a backing. This backing will allow the heat from the cells to be dissipated to the surrounding air. Remember, heat is the number one cause of cell failure. After the cells are mounted on the backing, a



SOLAR PANELS AT THE HOME QTH OF WB8VGE

clear cover must be installed over them. In the past a silicon sealer was used, like marine bathtub caulk if you will. This was at the time a ideal method. As tough as this stuff is, it could be damaged by stones, twigs and even birds. Today almost all PV panels are covered with iron glass. It is call iron glass not because it is strong, which it is, but because it has very little lead in its chemical makeup. The low lead contents makes for very clear glass. The cells are then sandwiched between the backing and the cover glass. A frame is then installed around the entire module and sealed against the weather. This sealing is of the utmost importance. The solar cell biggest enemy is the elements. Water, dirt and other chemicals from the air will destroy the cell. The module is then tested for the rated power at the standard light and temperature specifications.

Arco solar was the first company to make modules with the aid of machines, thus reducing time and labor. That brought down the cost per watt to about \$10.00. Thin film cells can be made even cheaper and the price for one watt of solar power is now at \$6.00.

Now that we know how the cell is made and the module constructed, let's take a look at peak power. You must understand the meaning of peak power to properly size a photovoltaic array to match electric power requirements. PV cells produce the same voltage regardless of their size or amount of sunlight. However, their power, or wattage, depends on both cell size and amount of sunlight.

When a solar cell is directly facing the bright sun on a clear, cool day, it's delivering peak power. But when sunlight strikes a PV cell at an angle, the cell delivers less than peak power. A fixed, properly oriented photovoltaic array produces peak power only at solar noon; early in the morning and late afternoon the output is much lower. From morning to dusk, a photovoltaic array will produce, on an average, about half its peak power.

Another factor that will affect the power of the array is temperature. As the array heats up from the sun, the cells heat up and thus slow down the conversion process. If the sun's energy travels through a very thin atmosphere, more power will be produced. In real life, most of the time the atmosphere is full of man-made junk and the amount of light striking the array is greatly reduced. When the atmosphere is heavy with pollutants, hazy and full of humidity, as in late summer here in Ohio, we can expect to receive only 25% of peak power from our array. As a side thought, the thin film cells can produce more power under such condition because of their construction. They like diffused light better than single crystal cells.

Photovoltaics is a rich and promising technology. The phenomenon of converting sunlight to electricity encompasses a diversity of materials and fabrication techniques. We have opportunities that are rich in discovery and invention. There is a change coming in the way we make electricity, why not be a part of it. □



## ACTION ON THE HAM BANDS

by Jim Mulvey, KS1A

60 Serenity Dr., Tewksbury, MA 01876

# Kantronics New DataEngine

Kantronics new DataEngine TNC is the type of PACKET machine we predicted would soon come along. While it offers the buyer a host of well thought-out features that you'd find on many existing TNCs, it's biggest asset is what it was designed for: POTENTIAL.

After several years of SOFTWARE advances in the PACKET world: bbs's, nodes, advanced message auto-forwarding, and better personal mailboxes to name a few, changes to the HARDWARE end have come much more slowly. Until now. It's PACKET's hardware side that will now take it's turn to advance. And things are about to move very, very fast.

When ever I run into a ham whose just getting his or her PACKET-feet wet, I try to answer questions and suggest how packet is "used best". If you're looking to have lots of straight qso's it is very frustrating indeed. What makes so many of us addicted to this incredible mode are: the wonderful DX spotting nets, the invaluable and rapid assistance you get from posting any question on the net bbs, how it's the very best way, bar-none, to stay on top of ham happenings across town or across the country, etc. Almost every newcomer is enthusiastic right back! And they're ready to dive right in. But, young people with computers often run my logic into a brick wall. When they learn that it's all done at "only" 1200 baud, they rightfully smirk and say, "Come on, man. We're doing 9600 and more." Like the driver with a cellular phone who can phone-in a traffic accident much faster than a ham with a hand held, here is another example of how hams are no longer at the forefront of electronic technology. With the advent of a COMMUNICATOR license on the horizon to entice computer literate newcomers, something had to be done about the SPEED. So here we go.

Announcing the addition of SPEED to the PACKET world. For the last three months my local NTS BBS has had a few 2400 baud nodes up and running. A couple of TNC manufacturers are offering an upgrade chip to speed your TNC to 2400 baud. Should you buy the chip or wait for the new 4800 baud chip? Can your TNC's architecture even handle 4800 if the chip was available? Probably not. And what about 9600, and all the various modulation types being proposed and announced? How can you buy a TNC that's not

going to be obsolete in a year? Ahhhh!

This type of technology headache is both beneficial and bothersome to an equipment manufacturer. The manufacturer can gain by setting up the marketplace standard, in this case 1200 baud, and selling a good deal of TNCs. Then new crops of units are sold as the marketplace demands higher speeds step by step. With each step the manufacturer sells a new crop of speed upgrades. The down side for the manufacturer is staying ahead of the market and hoping you don't spend money to develop a new unit, only to have the technology hungry market pass you by.

Kantronics new "adaptable" DataEngine is truly an excellent idea. The advertising boasts "Designed with the requirements of today's rapidly changing communications environment in mind, the Kantronics DataEngine represents the state of the art in speed, adaptability and programmability." In short, if you buy one, you can do the normal 1200 baud packet and know that you're not getting what soon may be a white elephant. The DataEngine is made to be completely adaptable to whatever the marketplace throws out there. Higher speeds, different codes, etc. If someone at TAPR decides the new standard is going to be an unusual speed like 9872 baud, you can still use your DataEngine.

But, that's only the beginning, because "adaptable" really means "adaptable". The DataEngine was designed with a completely open architecture and a technical developer's manual (available from Kantronics), so third party's and hams can develop their own data applications. This is very exciting. Here is a lean, mean, data machine made by a company that is boldly saying, "We've made the ultimate versatile product. Here's a dependable vehicle to experiment and develop new data applications." Adding to it's "developer friendly design", Kantronics DataEngine includes sockets for 5Mb EPROM and 5Mb of RAM!!! Here comes full data dumps from your local NTS board right to your TNC without the worry of overloading the buffer.

When the unit first arrived from Kantronics I was surprised at it's look. It's the same size as my multi-mode Kantronics KAM TNC (which Kantronics is continuing to support and

upgrade!), but the front panel was an INITIAL disappointment. It's eight red LEDs lack labels like "xmit, rcv, sta, etc." Instead the DataEngine's front panel LED's are simply labeled A1 through A8. You wonder why they'd do such a thing? And then the answer hit's you like a ton of bricks! My pulse started to race. It's genius! If they labeled the LED lights to be specific functions, that would lock in those lights to those specific functions. The whole point of the DataEngine is to be a super-fully functioning packet unit as is, AND a totally open architecture to create with, and assign those lights to indicate features not yet thought of. Way...to....go!! After a half hour on the air I was fluent as to what LED indicated a station connect, which indicated that I had mail waiting in the unit's PBBS, etc. Piece of cake.

What a novel idea. A product that's designed to change with the technology and engineered to help develop new ones.

Also found on the front panel: a green POWER LED, a push on/off POWER switch and a similar AUX on/off switch (said to be used for factory testing). I smiled when I found two hidden "dead-end" windows on the front panel to be used for future applications! Since they are not yet used, you have to search the front panel to find them. Again, the unit is designed with FUTURE in mind.

On the back you'll find a two-pin molex connector for power, 12 VDC, >200 ma of current is required. There's an RS-232 for connecting to the computer and two, DB-15 radio port connectors. Cables and connectors are supplied.

Here's some bread and butter information: The Kantronics DataEngine is a true dual port, full duplex TNC. It runs on a 16-bit V40 PC compatible microprocessor running at 10 MHz. That's right up with today's computer standards. It had to be a powerful little bugger to stand up to it's claims, and to the needs of developers. It is shipped with a base configuration of AX.25 firmware and one 1200 baud modem (there are three KEYBOARD selectable carrier detect options). Your choice of faster modems will be available so you can keep up with the pack, no matter which way they head. The DataEngine accommodates up to two internal OR external modems! This



opens the field right up. It accepts modems from other manufacturers including Texus, K9NG, G3RUH, HAPN and of course, TAPR. You just connect up these external modems via the DB-15 connectors on the DataEngine's rear panel. Hooking up units from different manufacturers can be tricky, so Kantronics provides a list of all the pin assignments. You can be sure of any kind of connection.

I LOVED the DataEngine built in PBBS. Not only can I have my county's local NTS packet board forward all my mail to my DataEngine, I can even enter messages to be forwarded! While the KAM has a similar PBBS, only with the DataEngine can you enter a message to be picked up automatically by any full-service BBS! (RLI, MBL, etc.) This advance will lead to freeing up time on the local full-service BBS. Because instead of logging on one at a time to your area's main BBS and keeping others from connecting, the main BBS will be able to efficiently log onto you at 9600 baud and deposit all the day's mail and personal messages. And, move on. You may then take all the time in the world to read the news without tying up the main board. And eventually with 5Mb RAM in your DataEngine you can have pages and pages of fresh information waiting for you each day. The DataEngine PBBS allows you to enter a message in true NTS format for proper auto-delivery.

The DataEngine fully supports Phil Karn's KISS mode, where the unit acts as a modem and packet assembler/disassembler. TCP/IP has become very big with the digital crowd! ROSE X.25, TCP/IP and G8BPQ code for the DataEngine are all well under development.

The DataEngine would be terrific for satellites, and the new modulation schemes being announced. Setting up a gateway with the dual ports is simple.

You get two manuals, one for the DataEngine and one for the DE1200 Modem. I was delighted to find a wiring chart for cabling up just about any of the popular hand-helds. There's a jumper with three settings for EQ. And, there is a jumper for AFSK output level into your transmitter. This is a crucial setting in any packet setup, and care should be taken to get it right. (Simple!)

On the air: I found the DataEngine as easy to operate as my Kantronics KAM at 1200 baud. I was familiar with just about all of the packet

commands from the beginning, so I got right to it. After a few minutes of flawless performance I reminded myself not to be disappointed. There weren't many new packet commands in the DataEngine. There didn't have to be. It is a complete, full featured TNC. IT's real power is in the unit's ability to accept all the higher baud rates with the change of a modem. Right now. It's power is it's open architecture and encouragement for developers to develop. IN SUMMATION: HERE ARE ALL THESE BENEFITS IN AN EXCELLENT DATA-UNIT THAT WON'T BE OBSOLETE IN A FEW YEARS. I CAN KEEP UP WITH THE ADVANCES AND CHANGES IN TECHNOLOGY THAT WILL INEVITABLY COME ALONG. I JUST SAVED MONEY.

Kantronics could use a bit more "brag" in their literature. When the unit arrived, I read the manuals cover to cover and wondered what the big deal was. From the manuals, you don't get any idea just how exciting this unit is. In print it looks like another very good packet unit. Kantronics should enclose a descriptive sheet that says, "Look what you've just bought! You'll own this one for a long time. It is so adaptable it's stupid. Others will develop all sorts of applications not even dreamed yet, and you'll be able to do all that stuff with this unit you just bought! You'll be able to upgrade to amazing speeds at terrific baud rates! In the meantime, enjoy what we hope is the finest PACKET TNC on the market with the most features, and it's made in AMERICA."

The DataEngine manual itself is an improvement over previous manuals. It starts to remember that many new hams will want to buy this unit, by including important basics like: "Monitoring and Calling CQ on Packet", and "A Simple Connect." The industry should take the user-friendly concept one step further and include a friendly one-sheet for beginners. A sheet found right on-top of the manual that would take you through a sample contact from beginning to end, and tell you what to expect! PACKET for the beginner can be very confusing. A friendly sample contact on a "sheet-for-beginners" is more desirable than picking up the knowledge here and there in a technical owner's manual. The DataEngine documentation, however, is not bad at all. In fact it's very thorough with a complete description of every command and it's settings.

I worry that the reader will question an almost totally positive review. I have always had very

good luck with Kantronics products. My KAM hasn't been left on continuously for several years now without a single problem. The DataEngine incorporates all the advanced commands they have developed in their stable of TNCs, and the idea that the DataEngine is ONE TO GROW WITH is revolutionary.

Kantronics of Lawrence, Kansas has the same attitude you find from TenTec: they are polite and helpful when you call for support. Bingo. That's reason enough for me to pick a product over the pack. I wish more American companies would learn that if we're going to compete in global economy you can't foster an "I'm doing you a favor, bub" attitude toward the customer. So, Kudos Kantronics. Nice job. □

(cont'd from page 15)

other station's call or anything else you can think of that you might send a lot (examples are in the manual). These messages that you create can be easily changed and saved to disk and are automatically loaded each time you use RTTY-PC. They can also be quickly viewed and/or changed in the lower window while simultaneously receiving in the upper window. Or, if you like, you can use the "full screen" message changing method where you have the entire screen to view and/or change a message.

Even if your keyboard only has 10 function keys, the RTTY-PC diskette includes software to re-define two other unused keys of your choice as F11 and F12. Or, if F11 and F12 on your "compatible" are not strictly IBM PC-AT or PS/2 compatible (fairly common), you can show RTTY-PC how to recognize your F11 and F12 keys. Separate software is provided on the diskette, so you can do this if necessary; it is easy to do and only needs to be done once.

While using RTTY-PC, you can also:

- Transmit disk files
- Save everything that you receive and transmit to disk. You can either name the file yourself or have RTTY-PC automatically name it for you.
- Print everything that you receive or transmit to a printer. You can save to a disk file and print to a printer simultaneously if desired. Files and printouts are marked showing mode and receive/transmit.

For pricing or other information, contact: Comtech Research, 5220 Milton Rd., Custer, OH 43511; 419/278-6790. □



# LANLINK

## APPLICATION NOTES

by Joe Kasser, G3ZCZ

P.O. Box 3419 • Silver Spring, MD 20918

## Connecting With LanLink

LAN-LINK lets you minimise the keystrokes necessary to connect to another station. There are several ways to connect to the other station as described below. However before you connect to someone else, remember that LAN-LINK treats incoming connects and outgoing connects differently. To connect to another station, Use the Alt-C hot key, Function key 5 (F 5), or bring up the Call Menu by touching the 'Esc' key and choosing the 'C' option. DO NOT TYPE

### 'C Callsign'

in the command mode. If you do, the connect will still take place (the TNC won't know if you or LAN-LINK issued the command) but LAN-LINK will treat it as an incoming connect and issue the "[ZCZ] LAN-LINK 1.56>" handshaking signal (if the LAN-LINK flag is in its default, or enabled state). If you connect to a BBS or a Node this way, you will get an error message back from the BBS or node, since it does not recognize LAN-LINK's handshake.

When you use the Alt-C or F5 approach you can also make use of the 'path memory' feature in the LAN-LINK.DIR file.

### Point and Shoot MH List

You use the F5 approach to connect to a station that you have heard. When you touch Function key 5, LAN-LINK sends a 'MH' command to the TNC and the MH list shows up in a special window and freezes until you depress any key. While the list is frozen, LAN-LINK is not monitoring received data, so don't freeze it too long. Move the cursor to the desired callsign. When the cursor is positioned on any character in the call, press the 'Enter' Key and that call will be recognized as the callsign. If the call is joined to the word "Cmd:" or the cursor is positioned on a space or blank, the connect attempt will be inhibited.

### Using the Call menu

When you use the Alt-C hot key or the The Call Menu LAN-LINK will remember the previous 15 calls and you may use the Up and Down arrows to move the cursor to a remembered call. If you wish to capture a call from the incoming text window, push Function

Key 10 (F10) to enter the window and move the cursor to the desired callsign. When the cursor is positioned on any character in the text, push the 'Enter' Key and that word will be recognized as the callsign. Any characters joined to the call (such as a '.') will be picked up as part of the call. If the cursor is positioned on a space or blank, the connect attempt will be inhibited.

In AMTOR, whenever you are asked to enter a callsign, LAN-LINK will prompt you with its guess at the SELCAL. If you agree with it, just press the 'Enter' Key, if you disagree, enter your choice over the prompt version.

### Names, Handles and Paths

If you so desire, you can create a directory file (default name is LAN-LINK.DIR) and keep a list of names and calls. The computer will look up a name and call the station by its callsign. For example if you put

Joe G3ZCZ

as a line in the file, when you tell the computer to connect to Joe, it will try to connect to G3ZCZ. If you enter

4X4HF 4X4HF V 4X1AA, 4Z4ZB, 4X4IL

you only need to type '4X4HF' to set up the correct connect path.

You can also use this feature to automate a NET/ROM and/or a KA Node path connection.

### NET/ROM and TheLink

In the manual NET/ROM path setting up mode, you would first connect to your local node, then when you are connected with it, connect to the next node, and so on through any intermediate nodes within the whole path before you finally connect with your destination station. You may also have digipeaters in any of the paths.

For example if you wish to connect to K1HTV who is in range of the SCCT node, and you are in Washington DC, you might first have to connect to your local NET/ROM node (ELK) via a digipeater, then each of the intermediate nodes, SNJ3, NNJ, WMA before you could

try to connect with K1HTV.

Consider the manual sequence to make the connection. K1HTV is the station the contact is being attempted with, and he is located within range of the SCCT NET/ROM node. The station attempting the connect is located in the Washington DC area one digipeat away from the ELK NET/ROM node.

The connection to the local node is performed first. The operator has to type 'C ELK v WB4APR-5' to make that link. When the connect with the node is achieved, the operator must type 'C SNJ3' to connect to the next node. Each time the connection is made, the operator must type in the command to make the next one, until finally the last node is reached and a connect request can be made to the destination station (either direct or via a digipeater). Sometimes there may be an intermediate non-NET/ROM connection between two stations somewhere in the path.

This procedure is tedious and time consuming, because it may take several seconds to complete each stage of the link. LAN-LINK automates this sequence by scanning the line in the LAN-LINK.DIR file associated with the callsign entered and transmitting each section of the line when it recognizes the 'Connected to' reply from each NET/ROM node in the path. When it finally gets to the destination it sounds a chime to alert you that the connect has been achieved.

The LAN-LINK.DIR file entry for this path is as follows:

K1HTV ELK v WB4APR-5!SNJ3!NNJ!WMA!SCCT!K1HTV

where the '!' separates each stage of the link.

The key word is K1HTV. LAN-LINK then scans the line to see if there is a '!' in it. If there is it knows that it is dealing with a NET/ROM path. It then tells the TNC to attempt a connect with the characters following the key word up to the first '!'. In this case it tells the TNC to connect to ELK via WB4APR-5. When the TNC sends back the connected message, LAN-LINK tells the TNC to try to connect to the next node in the path, namely in this example, SNJ3. The sequence continues each time a connection is made until the link is complete.

To set up a directory entry just use the format shown above. Place a '!' sign after the uplink



path and different node segments. Do not place one after the downlink path.

Depending on the configuration, LAN-LINK will issue a 'disconnect' command to the TNC in the event the NET/ROM or KA-Node connect attempt fails. This feature is designed for known paths not for general path determination.

#### KA-Nodes

You can connect or crossconnect via KA-Nodes using the directory file. You must still use the ! separators as well as two new symbols % and &. Use % for 'C' and & for 'X' in KA-Node links..

For example, given that a path to W9TNN-2 is first to a local KA node [JRW] then to a second node on the same VHF frequency [W3EAX-7] and lastly via a cross connect on 40 Meters to W9TNN-2, the line in the LAN-LINK.DIR file would be as follows.

```
w9tnn-2 jrw!%w3eax-7!&w9tnn-2
```

You can mix NET/ROM and KA-Node paths as in:

```
n7dva!g3zcz-9!&WA6IEL-4!n7dva v ki7vz-3
```

The different symbols are used for the KA node to tell LAN-LINK which replies to look for as well as what to prefix the call with.

Depending on the Node Drop Link Flag configuration, LAN-LINK will issue a 'disconnect' command to the TNC in the event the NET/ROM or KA-Node connect attempt fails. This feature is designed for known paths not for general path determination.

#### Loop Backs

In the Packet Communications Mode, if you want to loop back to yourself through someone else you would have to type

```
C <yourcall> V <hiscall>.
```

For example if I (G3ZCZ) wanted to loop back through G3RWL, I would have to type the command

```
C G3ZCZ V G3RWL
```

to the TNC.

In LAN-LINK you just have to enter the '/'

character followed by the call of the station you want to loop back through. For example if I (G3ZCZ) wanted to loop back through G3RWL, I just need to enter

```
/G3RWL
```

as the call to connect to at the Alt-C prompt, and LAN-LINK will tell the TNC to try to connect to G3ZCZ via G3RWL, namely issue the command 'C G3ZCZ V G3RWL' to the TNC.

LAN-LINK has special hot keys for connecting to a BBS and packet cluster. Try the Alt-Y and Alt-Z keys instead of the Alt-C key.

73, Joe / G3ZCZ

LAN-LINK is available from the author. For an evaluation copy, download it from Compu-Serve or send \$5.00, or send \$35.00 for a registered copy which will entitle you to at least one free update. When you write in, say where you saw this Application Note. ☐

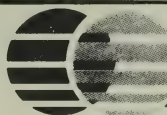
## Many UK Professional Radio Operators...

say that the ME605 is possibly the finest Morse Code key in the world. Previously only sold to government agencies and defense contractors, Morse Equipment Limited is now making the ME605 available to radio amateurs. Claimed to have the best possible balance, thousands of ME605s are in use by training and operational personnel around the world. For full details and pricing, write Morse Equipment Limited, 70-80 Akeman Street, Tring, Herts HP23-6AJ, United Kingdom, or call 011 (442) 89-0890;

Source WesLink Report: 06/08/90

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## PakTerm Terminal Program

The PK-232 by AEA is a winner. With over 40,000 units in place in ham shacks all over the world. The PK-232 has become a classic. The PK-232 has also become known for its complexity. I wonder just how much midnight oil has been burned by hams trying to figure out all the features of the PK-232? The manual is the size of some phone books!

Well, this month we'll take a closer look at a solution to the PK-232 blues. PakTerm by Dick Lichtel, KD4JP. PakTerm is a terminal program for PC compatible computers. It's a split screen host mode program with a high-quality log book function thrown in. PakTerm acts as a shield from the PK-232. You don't have to worry about the PK-232 manual, although you should read the AEA manual over too. With PakTerm, you get all the goodies the PK-232 has to offer, and then some.

I tested PakTerm on my Tandy 1000SX running with a 286 speed up card. A 20 MEG hard drive along with 640K of ram rounds out the system. PakTerm will operate with 256K of ram, but some functions may be impaired. PakTerm will also run from a floppy drive. I used DOS 3.3 for testing PakTerm.

PakTerm comes with a pre-printed manual. Although the manual is a bit on the small size, it's packed with information.

After you make some changes in the config.sys file you're on your way. The buffers and files must be increased so PakTerm will operate correctly. You will also want to add a line to your autoexec.bat file so PakTerm will set the proper time for you. PakTerm has very good online help. The PKHELP.1 file must be on the same drive and in the same directory as PakTerm. To execute PakTerm, just type PakTerm. PakTerm also has three options available; the -H -M and -N switches. If you have a EGA or VGA adapter, the -H switch puts the screen in the 43 line mode. The default is 25 lines. The -M switch enables the saving and restoring of Pakmail messages. The -N switch disables the saving and restoring of Pakmail messages.

When PakTerm is first run, the program will prompt you for a communications port. Be sure you tell PakTerm the proper port. In most cases, you'll be using COM #1. Check your system before pulling out any loose

hairs on your head. If COM #1 bombs, try COM port #2.

When you have told PakTerm the proper port to use, the fun can begin. The PK-232 being a strange critter it is, requires a bit of work before we can actually start talking to it.

If you have the internal batteries connected inside the PK-232, remove them. In my unit, I have a Lithium battery and a shorting block. If your PK-232 is like the one I have, simply move the jumper to disconnect the Lithium battery back-up. Turn the PK-232 off. Boot your computer, but don't run PakTerm just yet. Wait a few minutes and then power the PK-232 back up. Execute PakTerm.

PakTerm will look for the PK-232 and initialize the 232's parameters using the values stored in the file PKDEF.DEF. You will be changing these parameters later on to your own personal likes and dislikes. In particular, you'll need to change SELCAL & MYCALL in the parameter's list. After the PK-232 and PakTerm say hello to each other, we can begin to explore all the many features of the PK-232.

To move about in PakTerm, you can use either a mouse or keyboard. I don't have a mouse, so I used the keyboard. This caused me a little bit of trouble. There are lots of menus in PakTerm. Without a mouse connected, you have to run up and down the menu screens with the arrow keys. Yes, I know, it's not that big of a deal. But, running up and down to change something is a pooper. Without a mouse connected, I would like to see first letter activate the function. This would speed-up operation of PakTerm.

One of the first places you'll want to go is the setting default section. Here you will change MYCALL to your own call, write your connect message and do whatever else you want. This includes changing the colors to be displayed on the screen. After you're happy with the changes, go the file's menu and save the defaults for the next time.

There are many setup screens within PakTerm. A setup screen for AMTOR, RTTY, ASCII and MORSE is provided along with several others. Along with setting up the proper defaults, PakTerm can also store macro keys. These macros can be used to reduce key strokes

when connecting to a BBS or node. You can define a macro key with up to 60 characters.

Because PakTerm displays both local and UTC time in the upper right corner of the screen, be sure to include the proper SET statement in your autoexec.bat file. If you fail to do this, the UTC time will be incorrect. Since PakTerm will import this time when doing logging, your log time will also be incorrect.

Now if you have the PK-232 all connected correctly to your radios, let's give PakTerm a spin! One of the nicest features of PakTerm is the function key definitions. Although these do change somewhat depending on the mode being used, they stay about the same. In other words, the F3 key is XMIT for BAUDOT, ASCII, FEC call (AMTOR) and Connect on packet. Hitting the F4 key is receive for the modes above or disconnect for packet. So no matter what modes you're running on the PK-232, you'll always know how to go into transmit or receive, without looking in the manual. Of course the other function keys are defined differently. The F1 key opens or closes a capture file. The F5 keys locks the MORSE receive speed. The list goes on and on. If you forget what does what, pressing the ALT-K sequence will open up a command menu. If you're operating packet, you'll be shown all the commands available in that particular operating mode. If you're really lost, a convenient help's screen can be put on the screen by pressing ALT-H. Because the function definitions are different in each mode, this feature is very helpful. If you're growing tired of packet, pressing ALT-Z opens up another window to choose a different mode.

If you're like me, I like to monitor what's going on the frequency, without being around the computer. You can capture incoming data for viewing at a later time. Or do as I do, redirect the data to the printer.

If you downloaded a particularly good message from a BBS, you can capture it in the buffer. Turn around and send the file out to a node or a second BBS. Since PakTerm has a scroll buffer, which can hold up to 900 lines of data, one can jump to any line or search the buffer for key words. The search can be either forward or backwards. The search is case specific, you must match lower and upper case exactly or PakTerm will not find a match.



To get online with packet and PakTerm is easy. When you go to the packet window, you'll see a blank screen with a status window at the bottom of the screen. The status window for packet contains a variety of information specific to packet. The packet status, the number of unacknowledged packets, the number of retries and the channel numbers are displayed in the status window. These are abbreviated by the letters: A; U; R; and CH: respectively. PakTerm displays the call sign of the station you're connected to. You can change some parameters by toggling the function keys. For example, MDMON can be toggled by pressing the F6 key. By pressing the F10 key you can toggle the parameter VHF on and off. Likewise, pressing the F9 key will change the value of HBAUD. You can list the stations your PK-232 has heard so far by pressing the END key. The stations marked with a \* designate stations directly heard by your station. This will make it much easier for a direct connection between you and other station.

To get things moving, press the F3 key. A small window opens up and asks you for the call of the station you want to connect to. Press return and the PK-232 will startup. If the other station is on, and he can hear you, a connect will appear on the screen. I have the connect message appear as a different color on the screen from the rest of the text. The top half of the screen is the receive viewing field. The bottom half is the transmit buffer. This is the same on all modes.

I've use PakTerm on just about all modes. PakTerm works well. I really enjoy running MORSE on the low end of 40 meters at 50 WPM. Or BAUDOT on 20 meters. I did not try out the FAX receive as I didn't have a receiver for the FAX frequencies.

The newer PK-232s have an extra feature, PakMail. You must have maildrop set to on, or you'll get an error message. You can read, send, kill and list messages. PakMail is turn on and off by a function key.

After you're done with the contact, disconnect by hitting the F4 key. If you had the buffer on, you can no go back and re-read the information received.

All the other modes work about the same way. Each one is a bit different. Although you should have no trouble getting the other modes to work. The possible exception would be AMTOR. The most likely cause is operator

error. AMTOR can be a bit of a hassle, until you get the hang of the mode.

In most of the log book programs I've reviewed in the past; some have enclosed a communication sub-program to connect the PK-232 to the computer. In PakTerm, the opposite is true. PakTerm has a QSO log facility built-in. PakTerm provides a means of keeping a log of QSOs. PakTerm can also search for previous contacts made on a certain frequency, in a certain mode, and/or a certain date. Most of the fields are self-explaining.

As with any log book worth its salt, PakTerm allows you to print out the log book and even make sticky labels for your QSL cards. As a side benefit, PakTerm will import the call of the station being work. PakTerm will also update the time and date in the proper field by pressing the F2 key. Another time saver is the F3 key. Pressing F3 will up-date the station information from a default file you can make. This saves time, and you can always change it later on by editing the log book. PakTerm has a very good logging sub-program. I don't know if I'd use it as my one and only logging program thought. I don't really like the idea of a two-in-one program. This is just my thinking. I'm sure there are many people who enjoy having a log program within a communications program.

Well so far this has been a rather glowing review. So is there something I don't like about PakTerm? Well, not really. Without a mouse, changing from one menu to another is slow going. I did find typing at a faster than two finger typing I seem to lose a letter here and there. I seem to make more typing mistakes when I use PakTerm.

The one big complaint is really not the fault of PakTerm. It goes like this. If you don't want to leave the computer running with PakTerm, but want to use PakMail, you're in deep dung. The PK-232 will not support the mail box without PakTerm running. If you run the PK-232 as a mail box without the computer on line and running PakTerm, the PK-232 will dump the contents of the mail box when you boot up PakTerm. I talked with Dick about this on the phone and he knows about it. However, there is not much a programmer can do to get around this problem. Seem to be a problem with the PK-232. It does not really lose the messages, but just can't find them when PakTerm initializes the PK-232. Even though the -M switch is turned on when

you start up PakTerm, you still can't boot the computer and get your mail. The -M switch will save PakMail messages before you quit the program and then restore them when you boot back up later.

Other than that, PakTerm is a winner in the highest sense. PakTerm really makes the PK-232 shine. I can't say enough about the program. As a matter of fact, I really don't know why AEA does not package PakTerm with each PK-232 they sell!

PakTerm is sold by Dick Lichtel, KD4JP. The cost of PakTerm is \$30. As for major revisions, users will be notified and there will be a nominal charge for the revision, \$10. □

## Quorum WEFAX PC Adapter...

The Quorum Communications WEFAX PC Adapter is an intelligent scan converter for HF FAX, NOAA APT, GOES WEFAX and Russian Meteor weather images. It contains an on board Microcomputer with a builtin 8 bit analog to digital converter which, in conjunction with software running on the host PC, provides the most user friendly and functionally integrated weather FAX reception system on the market.

The on-board microcomputer provides all of the sensitive timing and synchronization necessary to receive the image data without relying on customized timing loops or concerns with the PC processor or clock speed. Because of the on board microcomputer, the WEFAX adapter provides identical performance to users of 8088, 8086, 80286 or 80386 Processor based PCs. The PC functions as a display, control and file system for the WEFAX adapter.

The Quorum WEFAX PC Adapter provides audio inputs for all signal types, which are selectable from the PC keyboard. The Quorum SL-137 APT receiver and SDC-1691 down converter complete the system and are also under software control. When the user configurable Program configuration HOT keys are properly setup, it becomes a single key-stroke to switch from ingesting GOES images to NOAA 11 APT configuration to grab the next pass. Time consuming and confusing cable swaps, frequency changes and

(cont'd on page 30)



## Amateur Radio & The PC

This column made its debut in the previous issue of Digital Digest. IBM Arena covers digital communications related topics specifically for microcomputers conforming to the IBM PC standard. In the premiere column, I discussed what makes up an IBM PC standard computer. I went on to briefly cover the basic hardware systems in an IBM PC compatible system unit. I finished with a discussion of some of the inner workings of DOS - the Disk Operating System.

I'll continue to discuss general hardware and software items that apply to IBM PC compatibles the world over, but the purpose of this column is to cover the use of an IBM PC compatible in amateur radio digital communications. Tom Arvo and I have discussed various ideas for future topics, and we'd like to hear from you also. If you have any suggestions or comments, please contact me or Tom by US mail or CompuServe Mail (my ID is 72276,2276 - Digital Digest's is 73330,1335).

### Column Topics

As you are probably aware, Joe Kasser, G3CZ, is now writing a column in Digital Digest about his LAN-LINK program. LAN-LINK is an intelligent user-interface for use with packet radio TNCs and multi-mode data controllers. I plan to introduce LAN-LINK in this column in the near future; however, refer to Joe's column for specific application ideas once you're hooked on the program.

Another hot topic for a future column is the computer controlled shack. We're all very aware of the use of the microcomputer in the shack. We use them as terminal emulators, to track satellites, and to plot propagation paths. However, it is becoming increasingly common to find microcomputers actually controlling transceivers - and not only for digital modes. We'll take a look at controller systems available for the IBM PC compatibles that will allow you to tune your rig with a few keystrokes, rather than turning knobs.

### Laptops

Enough about future installments. The first topic I'd like to cover in this issue is laptops. PC Magazine ran a story recently regarding the surge in popularity of IBM PC compatible

laptop computers. They reviewed numerous models, 73 I believe, in several classifications.

The reason I'm discussing IBM PC compatible laptops in this column is their usefulness in portable data communications stations. My first laptop was a TRS-80 Model 100; in fact, it's probably still one of the best laptops available - even though its about five years old. I've used my trusty Model 100 in several portable stations. However, since most of the latest software is written for the IBM PC standard, the Model 100 is limited in what can be done with it.

A portable IBM PC compatible computer, on the other hand, can run just about everything that will run on a desktop system. This means you can use the same software and accessories that you use in the shack while operating remotely. Also, the options and price ranges available in laptop systems equal those associated with desktop systems - so the decision making process isn't any easier. In fact, while the laptops are IBM PC compatible, each manufacturer has differing hardware standards for items such as memory expansion and internal modems.

There are three main categories of portable computers. Laptops are the smallest of the three and are typically less powerful. The next classification is the Portable. Portables are larger than laptops, too large to fit comfortably on a lap, but are typically more powerful. The final category is the Transportable. The Transportable systems are much too large and heavy to be carried often and certainly not on most trips.

The differences between the categories extend beyond size. Power supply and consumption is another major difference. Most all Transportables require AC power. Transportables typically have a small CRT display that draws too much power for battery operation. Transportables will usually take the same hardware add-ons and accessories as desktop machines.

Systems in the Portable classification will usually be powered by internal battery packs. Because they are larger, Portable systems usually have more expansion options than Laptop systems. Laptop systems are also

known as notebook computers - both because of their small size and the fact that they tend to take the place of a regular paper notebook with most users. The Laptop, or notebook, systems all run off internal battery packs.

The only reason I can see why anyone would want to purchase a Transportable or even a Portable computer over a Laptop is if it will be their only computer system, serving as both a portable and a desktop. Otherwise, I think that it is imperative to get the smallest, lightest laptop that has the basic features necessary to run the software that you are used to using. What good is a portable computer that you have to struggle to take with you?

I don't think twice about carrying my T1000SE with me. If I'm only going to be gone for part of the day, I'll just take the computer itself, treating it much like a notebook. If I'm going to be gone longer, I'll put the T1000SE in its carrying case along with its accessories. I also keep a Heathkit Pocket Packet TNC and an Icom 02AT in the case for portable packet operation.

While the Toshiba T1000SE was the best available laptop computer for me, you might be best served with another brand or model. To give you an idea of what features are included in a good laptop, I'll run down the major features of my T1000SE.

- 8086 processor, running at 9.54MHz or 4.77MHz
- RealTime Clock/Calendar - 1MB RAM standard, expandable to 2MB or 3MB
- 1.44MB Floppy
- Backlit supertwist double-scan LCD
- Full function, standard size keyboard
- Centronics parallel port
- RS-232 serial port
- Replaceable, rechargeable battery pack

The basic T1000SE sells for about \$1100. I spent another \$475 for a 2MB memory expansion card, \$250 for an internal 2400 baud modem, \$60 for an extra battery pack, and \$70 for the carrying case. There are also a myriad of other expansion options available.

Toshiba makes several other models of laptops and portables including the T1000, the T1000XE, the T1200XE, and the T3100SX. Other manufacturers of laptop and portable systems are Zenith, Bondwell, Compaq, Texas Instruments, NEC, and Sharp. Consult the 13 March 1990 issue of PC Magazine for more information about available models.



I'm sure that most owners of laptop computer systems that read Digital Digest have already thought about using their laptop as a portable digital communications station. I've already mentioned that I use mine with a Pocket Packet TNC and 02AT HT. The 02AT is a little large compared with the miniature HTs available today, so if you're planning on purchasing a HT for use with your laptop, I'd suggest taking a look at the miniature models. Don't forget to examine the battery life statistics for the various models. I've been told that the slim battery packs most of the mini-HTs come with will only last for an hour or so under average conditions. If that's the case, be sure to purchase an extra higher-capacity battery, if available.

My first portable digital communications station consisted of a TRS-80 Model 100, a Kenwood 2500 HT, and a Kantronics UTU-XT. A large 12Vdc gell cell powered the UTU-XT. This allowed me to operate 2 meter RTTY, where I could find any. Once packet gained increased popularity, I upgraded the station with first a TAPR TNC-1 (with a 12Vdc power supply modification), then a Pac-Comm TNC-200, and later a CMOS low-power version of the TNC-200.

I'm very pleased with my present portable station. And I'd be very interested in hearing about what other digital communications enthusiasts use in their portable stations. I'll be sure to mention responses in future columns so that we can learn from each others experiences.

### Windows 3.0

Before finishing up this issue's column, I'd like to briefly discuss the latest version of Microsoft Windows that was recently released amid much fanfare. I've been "using" Windows since its first release many years ago. I put the word "using" in quotes because it's not quite accurate - "attempting to use" is more correct. Each time I got a new version of Windows, I'd try to incorporate it into my operating environment. Unfortunately, after a few days, I'd give up on it and just use it whenever I needed to run a Windows based application.

Windows Version 3.0 has changed all that. Windows 3.0 is a superb product that is extremely flexible and easy to use. I now run all my applications under Windows 3.0, un-

(cont'd on page 32)

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## MacHam Software

### YES, THERE IS HAM RADIO SOFTWARE FOR THE MACINTOSH!

In the beginning, there was no amateur radio software for the Macintosh computer. As the Mac became more popular, a trickle of ham radio software became available for it and, today, there is a good variety of amateur radio software for the Mac... something for everyone.

The following is a compilation of the various ham radio applications that are available for the Mac listed according to category. Note that some of the software appears in more than one category because it does not fit into any one niche. Also note that the following is not a recommendation of any software; it is listed here only to answer those folks who ask what is available for the Mac? Finally note that the prices listed below may have changed since the price information was obtained. If the price has increased or decreased, don't blame me.

Future developments in the Mac ham radio software world will appear here. If I missed anything you are aware of, please let me know so that I can let everyone else know about it also.

I wish to thank Patty Winter, N6BIS, who provided some of the following information.

### Antenna Bearing and Distance Calculator

"DX Helper," MacTrak Software, PO Box 1590, Port Orchard, WA 98366; \$49.95

"DX Window," Engineering Systems, Inc, PO Box 939, Vienna, VA 22180, antenna bearing only; \$39.95

### Code Practice

"DX Helper," MacTrak Software, PO Box 1590, Port Orchard, WA 98366; \$49.95

"MacMorse," David A Kall, Suite 314, 700 Marine Pkwy, New Port Richey, FL 34652; \$29.95

"Morse 101," ZCo Corp, PO Box 3720, Nashua, NH 03061-3720; \$19.95

"Morse Tutor," Brincomm Technology, 3155 Resin St, Marietta, GA 30066; available by sending a blank formatted 800-kbyte disk and self-addressed, postpaid disk mailer

"N6MZV Morse Trainer," R T Martin, 10382 Orange Av, Cupertino, CA 95014; \$25

"Zihua Morse," PO Box 51601, Pacific Grove, CA 93950; \$39.95 or \$65 with speech synthesis

### Contesting

"FDlog!" System One Control, 3900 85th Av N, Suite 200, Brooklyn Park, MN 55443; for Field Day; \$49.95

"Six Shooter Contest Series," ZCo Corp, PO Box 3720, Nashua, NH 03061-3720; for ARRL 10-Meter, ARRL International DX, CQ World-Wide DX, CQ World-Wide WPX, Field Day and IARU HF Championship contests; \$59.95; reviewed here March-April 1990

### DXing

"DX Helper," MacTrak Software, PO Box 1590, Port Orchard, WA 98366; gray line, MUF, antenna bearing and distance, code practice, DXCC prefixes, International prefixes, Russian Oblasts; \$49.95

"DX Window," Engineering Systems, Inc, PO Box 939, Vienna, VA 22180; gray line, antenna bearing, DXCC prefixes; \$39.95

### FCC License Study

"Ham Radio 101," ZCo Corp, PO Box 3720, Nashua, NH 03061-3720; \$34.95

"Ham Stacks," Diana Syriac, N1GZS, 49A Meadow Pond Dr, Leominster, MA 01453; available by sending two blank formatted 800-kbyte disks and self-addressed, postpaid disk mailer

### Logging

"LOGic," Personal Database Applications, 2634 Meadow Bend Ct, Duluth, GA 30136; \$75

"QLog," ZCo Corp, PO Box 3720, Nashua, NH 03061-3720; \$39.95

### Multimode Controller Terminal Emulation

"MacRATT with FAX," AEA, PO Box C-2160, Lynnwood, WA 98036; \$59.95

"MacTTY," Summit Concepts, Suite 102-190, 1840 41st Av, Capitola, CA 95010; \$39.95

"MFJ-1287," MFJ Enterprises, Inc, PO Box 494, Mississippi State, MS 39762; \$19.95

"WeFaxWorks," Kantronics, Inc, 1202 E 23rd St, Lawrence, KS 66046; \$39.95

### Packet Radio

"Net/Mac & BM/Mac," Version 2.0, Tetherless Access Ltd., 1405 Graywood Dr, San Jose, CA 95129-4778; the Mac version of the KA9Q TCP/IP software package; \$5

"MacPacket," Brincomm Technology, 3155 Resin St, Marietta, GA 30066

"MacRATT with FAX," AEA, PO Box C-2160, Lynnwood, WA 98036; \$59.95

"MacTTY," Summit Concepts, Suite 102-190, 1840 41st Av, Capitola, CA 95010; \$39.95

"MFJ-1287," MFJ Enterprises, Inc, PO Box 494, Mississippi State, MS 39762; \$19.95

### Propagation Prediction

"DX Helper," MacTrak Software, PO Box 1590, Port Orchard, WA 98366; MUF; \$49.95

"DX Window," Engineering Systems, Inc, PO Box 939, Vienna, VA 22180; gray line; \$39.95

"Skycom 1.1," Engineering Systems, Inc, PO Box 939, Vienna, VA 22180; \$39.95

"Skycom 1.5," Engineering Systems, Inc, PO Box 939, Vienna, VA 22180; MUF, F0F2, FOT frequencies; \$39.95

"Sun Clock UTC," MLT Software, PO Box 98041, 6325 SW Capitol Hwy, Portland, OR 97201; gray line, world clock; \$34.95

## Radio Control

"ICOM IC-735 Control," KE6FG Software, 9763 Pali Av, Tujunga, CA 91042; \$49.95

"Remote Controlled Scanning System (RCSS)," Systems & Software International Ltd, 4639 Timber Ridge Dr, Dumfries, VA 22026; for ICOM IC-R7000; \$189.95 with hardware interface; reviewed here May-June 1990

## Satellite

"MacSat," BEK Developers, 1732 74th cir NE, St Petersburg, FL 33702; satellite tracking; \$10

"MacTrak," MacTrak Software, PO Box 1590, Port Orchard, WA 98366; satellite tracking

"QuikMac," AMSAT, PO Box 27, Washington, DC 20044; satellite tracking; \$50

"Satellite Helper," MacTrak Software, PO Box 1590, Port Orchard, WA 98366; satellite tracking; \$49.95

"Satellite Orbit Prediction Program," Earl Skelton, N3ES, 6311 29th PI NW, Washington, DC 20015; satellite tracking; available by sending a blank formatted 800-kbyte disk and self-addressed, postpaid disk mailer

"Satellite Pro," MacTrak Software, PO Box 1590, Port Orchard, WA 98366; satellite tracking; \$79.95

"TLMDCMac," AMSAT, PO Box 27, Washington, DC 20044; AMSAT Microsat telemetry decoding

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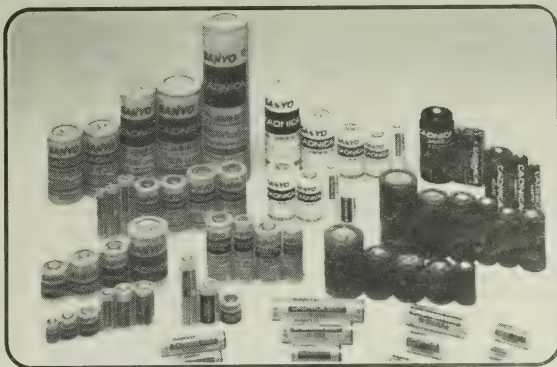
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(cont'd from page 18)

Select a letter from this list, or ? for more info: s

Enter name of new SIG (? for a list): ?

SIG	Msgs	Files	SIG-Op	Description
/Hello	10	0	Sysop	Questions and Answers about this BBS
/73mag	5	6	Sysop	Purpose of /73mag SIG
/cdreview	149	1	Edmur	CD Review
/bookshop	1	0	Sysop	Uncle Wayne's Bookshop
/hamhelp	2	0	Sysop	"Ham Help" uploads
/Letters	3	0	Sysop	Letters to the Editor
/Techtips	2	0	Sysop	Uploads for "Tech Tips."
/QRX	1	0	Sysop	Uploads for "QRX."
/mscripts	2	65535	Sysop	Article, Review, Column Uploads
/Proofs	1	0	Sysop	Author Proofs Uploads
/Comments	4	0	Sysop	Users' Comments for system
/whirl	1	0	Sysop	This SIG is for the WHIRL
/Hamsats	1	0	Sysop	Amateur Radio Satellites
/73intl	3	2	Arnie	73 International info
/trips	65530	65529	Sysop	The Adventures of Wayne Green
/ATV	8	0	Sysop	Amateur Television
/Foxhunt	1	0	Sysop	Foxhunting news and information
/QRP	6	0	Sysop	Low Power communications
/Packet	1	0	Sysop	Packet Radio - Digital Communications
/School	1	0	Sysop	Youth Forum and school SIG
/Hamfests	1	0	Sysop	Special Events for HAMS

## PacComm

The last BBS I'll examine in this article is the PacComm board. We all know PacComm as a supplier of quality packet radio equipment. Their BBS serves as a gathering place for present and potential PacComm customers as well as digital communications enthusiasts in general. The PacComm board can be accessed at (813) 874-3078. This time, I used 1200 baud, 7 bits, even parity, and 1 stop bit. Here's what happened when I logged on.

Welcome to PacComm's Electronic Mail System/BBS. This system is open to anyone who wants to use it. Its goal is to promote packet radio by providing a forum for the exchange of packet information, software and "electronic mail" among remote users and with PacComm. Questions and comments directed to PacComm will be answered here.

If you have something you'd like to share, please upload it. No copyrighted material, please.

If this is your first time on a "FIDO" bbs, you may want to make use of the help files. Just type a ? and carriage return at any menu.

Password: .....

Welcome to PacComm's Public Electronic Mail System/BBS.

Use Area 1, "PUBLIC" for mail with other users and announcements of a general nature.

Use Area 2, "PRODUCTS" to read about PacComm products. (read only).

Use Area 3, "PacComm," to leave messages and comments for PacComm (marked private, if you like) and we will reply to them here.

(cont'd from page 25)

level setups are unnecessary with the WEFAX PC adapter. It's even possible to confusing cable swaps, frequency changes and level setups are unnecessary with the WEFAX PC adapter. It's even possible to configure for satellite path direction so that a south to north pass builds up from the bottom of the screen.

Integrated with the audio selection capabilities of the WEFAX PC adapter, is a stereo tape deck interface that allows the user to tape the selected input signal along with a clock track, and then play back and ingest the image. When ingesting from the tape inputs, the sample clock can be phase locked to the signal carrier in the case of GOES or NOAA, or it can be phase locked to the tape clock track for Meteor or HF FAX.

For more information, contact:  
Quorum Communications, Inc.,  
P.O. Box 277, Grapevine, TX 76051  
Tel. (817) 488-4861

The BBS is running 300/1200/2400 bauds, 8 bit, no parity.  
\*\*\*\*\* We are having problems with our fixed disk \*\*\*\*\*

\*\*\*\*\* If the program hangs, try later. Thanks \*\*\*\*\*

You are the 4,438th caller  
Wait ...

MAIN Commands:

M)sg-Section F)ile-Section G)oodbye  
S)tatistics A)ns-Questionnaire B)ulletin  
Y)ell C)hange U)ser-List E)ditorial  
V)ersion

Main: M F G S A B Y C U E V or ? for help: f

File Area #1: PUBFILES\  
Public domain packet software and info files.  
A)rea-Change L)ocate F)iles T)ype G)oodbye  
U)pload D)ownload S)tatistics M)ain-Menu

File: A L F T G U D S M or ? for help: a

---- File Areas ----

1 ... PUBFILES\	Public domain packet software and info files.
2 ... PRODFILE\	Information and News about PacComm products.
3 ... PACFILES\	PacComm files - Technical Files for PacComm Products

File Area, or Quit: 2

File Area #2: PRODFILE\  
Information and News about PacComm products.  
A)rea-Change L)ocate F)iles T)ype G)oodbye  
U)pload D)ownload S)tatistics M)ain-Menu

File: A L F T G U D S M or ? for help: f



HANDIPAC.DOC	2484 HandiPacket information sheet
PSK1.DOC	3404 Microsat Modem Information
TMR.REV 4079	History of Circuit Board Revisions for TINY and MICRO
FIRMWARE.REV	2260 History of EPROM revisions
NB96SYS.DOC	1580 Description of PacComm Narrowband 9600 baud system
9600SPEC.DOC	4200 Specifications for PacComm 9600 Baud Modem
PC320SMY.DOC	993 Brief description of new intelligent PC packet card
PC320.DOC	2944 More detailed description of PC320
TNC320SY.DOC	1006 Brief description of new HF/VHF packet controller
TNC320.DOC	2944 More detailed description of TNC320
TINY-2.DOC	4880 Description of PacComm's \$120 packet controller
MICRO-2.DOC	5698 Description of PacComm's low power packet controller
TNC-200.DOC	2591 Description of PacComm's TNC-2 Clone
TNC-220.DOC	6698 Description of PacComm's Original HF/VHF packet controller
DR.DOC	5955 Description of DR-100 and DR-200 Digi-peaters
PC-100.DOC	2888 Description of PacComm's original low cost PC plug in card
TNC220.UPD	5370 Suggested modifications to TNC-220
More?	
PMS.DOC 14096	Description of PacComm's Personal Message System, Ver 1
PMS30.DOC	7455 Information about the version 3.0 of PMS
REVIEW.up2	7808 Unsolicited review of MICROPOWER-2 from CompuServe
RCH.DOC 2924	Announcement of PacComm's transceiver remote controller
- PacComm Commercial Data Communication Product Descriptions	
COML.DOC	734 Overview of PacComm commercial support.
WSYSTEM.DOC	2863 Overview of the PacComm Wireless Comm System
WIRELESS.DOC	4850 Wireless Modem (commercial grade packet controller)
WMUX.DOC	5289 Wireless Multiplexer unit (communications controller)
UMPAD.DOC	2982 Surface mount packet assembler/disassembler (PAD) [TNC]
MULTIPAD.DOC	2329 Multiple port packet assembler/disassembler (PAD)
HT-1200.DOC	2754 1200 baud internal modem for handheld radios
HT-232.DOC	1553 Subminiature RS-232/TTL converter
HT-1200A.DOC	2560 Combined HT-1200 and HT-232 on one board
CABINET.PRC	1735 Price sheet for custom aluminum cabinets

More?

File Area #2: PRODFILE\  
Information and News about PacComm products.  
A)rea-Change L)ocate F)iles T)ype G)oodbye  
U)pload D)ownload S)tatics M)ain-Menu

File: A L F T G U D S M or ? for help: a

---- File Areas ----

1 ... PUBFILES\	Public domain packet software and info files.
2 ... PRODFILE\	Information and News about PacComm products.
3 ... PACFILES\	PacComm files - Technical Files for PacComm Products

File Area, or Quit: 1

File Area #1: PUBFILES\  
Public domain packet software and info files.  
A)rea-Change L)ocate F)iles T)ype G)oodbye  
U)pload D)ownload S)tatics M)ain-Menu

File: A L F T G U D S M or ? for help: f

SHUTTLE.DOC	2324 Frequencies of Space Shuttle Audio and ATV
MB1109.EXE	279808 Self Extracting WORLI ver 11.9
BPQ353.EXE	77312 Self Unarcng G8BPQ node/BBS software Dec 23, 1989
BB25.ZIP	277761 Multiconnect BBS by AA4RE
MSYS106.EXE	332800 WA8BXN Packet BBS with TCP/IP NETROM.
APL393.EXE	145792 Latest (Dec 23) APLINK AMTOR/PACKET program

File Area #1: PUBFILES\  
Public domain packet software and info files.  
A)rea-Change L)ocate F)iles T)ype G)oodbye  
U)pload D)ownload S)tatics M)ain-Menu

File: A L F T G U D S M or ? for help: ?

#### FILES SECTION

A ... Change the FILE AREA	M ... Quit to MAIN SECTION
F ... List of Files	L ... Locate a File or Files
T ... Type (display) a File	D ... Download (to you)
U ... Upload a File or Files	S ... Statistics: Disk Space, Etc.
G ... Goodbye (logoff)	

#### Conclusion

I believe that with this three part series on amateur radio related landline telecommunications I've been able to cover all the material most people will need to get started. It's my hope that you'll try replacing your TNC with a landline modem once in a while. There is a great deal of information accessible with your microcomputer and a modem. I've given you three good examples in this article. And, don't forget about CompuServe's HamNet either. While I'll move on to another subject for this column in the next issue, I'll continue to keep you apprised of interesting numbers for you to call. □



(cont'd from page 27)

less I'm just planning to run one DOS application and then turn the computer off. Additionally, Windows 3.0 does a great job with memory and protected mode management on 386 systems.

With Version 2.11 of Windows, memory management was a headache and a half. I ended up having three different CONFIG.SYS files that I would reboot with depending on whether I planned to use Windows. Now, Windows 3.0 is very gracious with sharing extended memory with other programs. And when Windows 3.0 is run on a 386 system with at least 2MB of RAM, it does an excellent job of multitasking applications in virtual 8086 machines.

Windows 3.0 is organized differently from all previous releases of Windows. In previous versions, all files were displayed in a directory-like format. Users had to select an executable file from among all the displayed files. Additionally, they had to know where these files were located on the disk. You can still do this in Windows 3.0 with the File Manager, but with the new Program Manager, users can select an application icon that is stored in an application group without concern for that program's executable file's physical location on the disk.

For example, I'm using Microsoft Word 5.0 to write this column. I started Word by double clicking on the Non-Windows Applications group icon on the main Program Manager screen. A window then opened displaying all the icons for the Non-Windows Applications that I had earlier installed. The icon for Word looks like a computer screen with lines of type displayed on it, and Microsoft Word 5.0 is printed beneath the screen. I double clicked on the Word icon and Microsoft Word 5.0 popped up on the screen. No changing drives or directories and no commands to type. I can, at any time, change to another application without quitting Word. Additionally, I can select text from Word and transfer it to any other application running that will accept it.

As you can probably tell, I'm very pleased with Windows 3.0. If you're using a previous version of Windows, I strongly suggest you upgrade. And if you haven't yet tried Windows, I suggest you do so. Windows 3.0 is one of the best applications for 386 computer users, but don't despair if you're using an 8086, 8088, or 80286 system. Windows 3.0

takes maximum advantage of whatever capabilities your system has. It's one of the few programs available that will use the protected modes available on the 286.

### My Systems

I wanted to describe my IBM PC systems in the first column, but there just wasn't enough space available. So, I'll do it now. I currently use three different IBM PC compatible computers. My main system is a CompuAdd 320 with a 386 processor running at 20MHz. I have 4 megabytes of 100ns RAM, a Connor 80 megabyte IDE hard drive, and both 1.44MB and 1.2MB floppies. The display on this system consists of a Paradise VGA Professional card driving a NEC MultiSync 2A monitor. I also have a Hitachi CDR-1503S external CD-ROM drive, an Everex 24E 2400 baud external modem, and a Logitech Hand Scanner. A Hewlett Packard LaserJet Series II printer rounds out this system.

My other desktop system is a PC Designs "Plain Vanilla" XT clone with a PCSG 286 turbo board in it. This computer has 640K of RAM, two 360K floppies, and a 20MB Seagate hard drive. I use an Everex EVGA card to drive an IBM color monitor. The final element of this system is an Epson MX-80 printer with the Dots Perfect upgrade.

The newest PC is my Toshiba T1000SE laptop. It has 3 megabytes of RAM and a 1.44MB floppy. The display is a built-in CGA compatible backlit LCD. I also have a 2400 baud internal modem and an extra battery pack. The whole system weighs in at about 7 pounds and is the size of a standard three-ring notebook.

I use the 386 system most of the time. Most of my writing is done on this system. I also use it for a variety of other tasks - such as financial management and telecommunications. The PC Designs computer is more of a shack system. It spends most of its time serving as a terminal emulator. Finally, the Toshiba accompanies me on trips and is used often for word processing - even when near the 386. The Toshiba also makes an excellent telecommunications computer. I use the internal modem for accessing on-line services, and I connect a Pocket Packet to the serial port for packet operation.

### Conclusion

I hope you've found this column interesting

and informative. Please contact me with any ideas or suggestions you have for future topics. I want this column to reflect the diversity of amateur radio digital communication activities occurring with an IBM PC compatible. Amateur radio operators are an inventive and creative group. It's my hope that with this column, we can learn from each other and expand our operating enjoyment.

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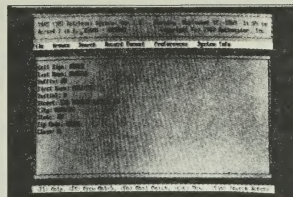
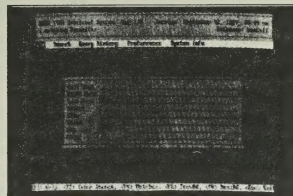
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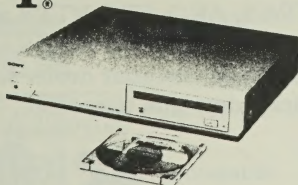
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